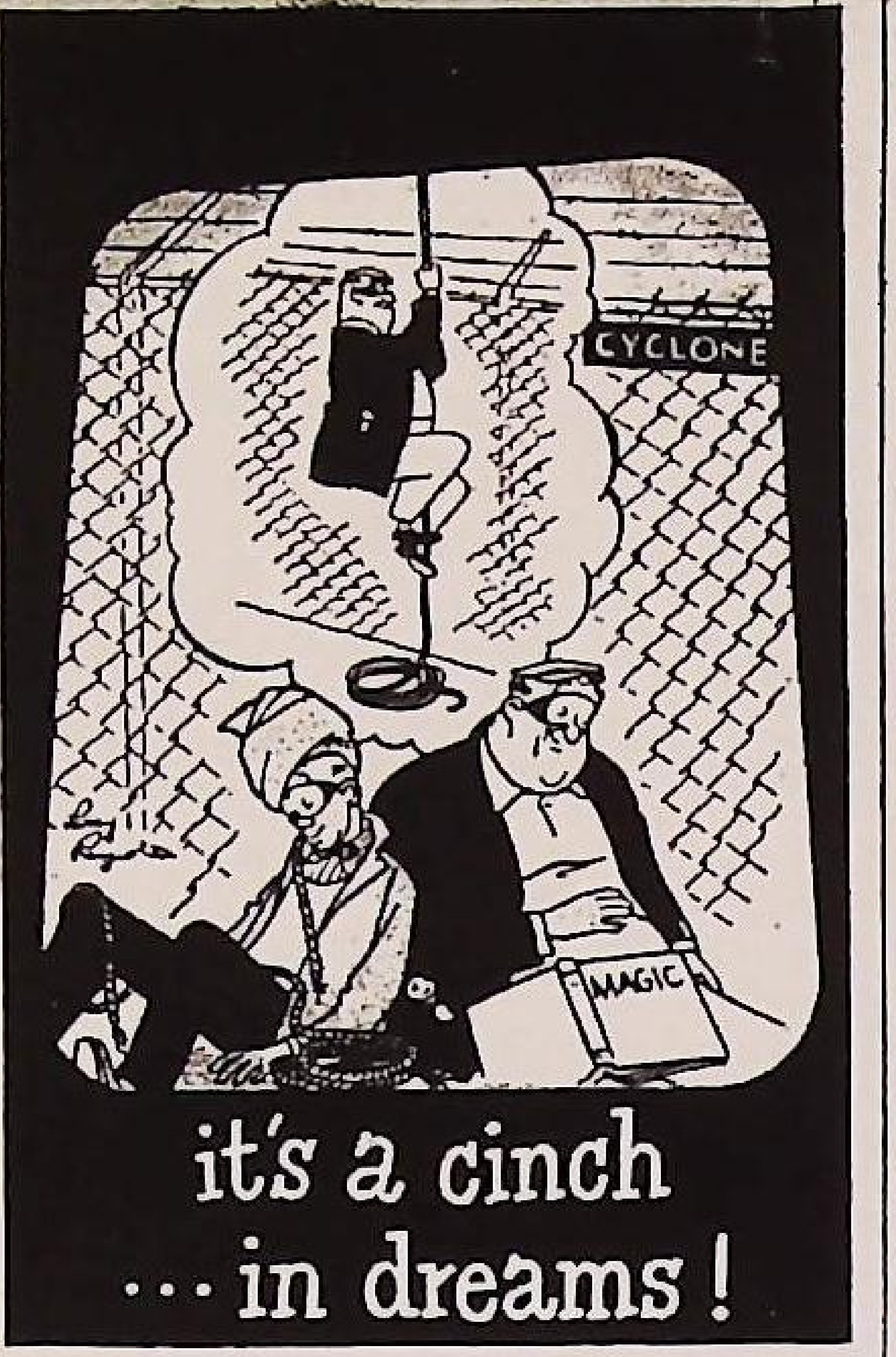


We can't blame these thugs for trying to master Cyclone with magic. A Cyclone Fence is a tough obstacle for any criminal to cope with. And plenty of plant executives know that; in fact, Cyclone is the world's most widely-used property protection fence.

A Cyclone Chain Link Fence protects property for long, trouble-free periods. This is why: it is strongly constructed of special steel fabric—galvanized *after* weaving for complete weather resistance. It embodies special features of design and construction. Installation is made by factory-trained men who really know their business. And these experts are never satisfied until they are certain that the Cyclone Fence will *stay* taut and true.

Send for our free, illustrated book—"Your Fence." It's factual, highly-informative and interesting to read. Then, if you want help in planning your fence—in making cost estimates—ask for assistance (there's no obligation) from our sales engineers. Remember: *No job is too large — no job is too small for Cyclone.*

CYCLONE FENCE DIVISION
(American Steel & Wire Company)
WAUKEGAN, ILLINOIS · BRANCHES IN PRINCIPAL CITIES
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEND FOR FREE BOOK

You'll find our big, 32-page fence catalog a valuable reference book. Crammed with pictures, facts and specifications covering many styles of Cyclone Fence, Gates and many other property safeguards. Whether you need a few feet of fence or several miles of it, you will want this useful book.

Cyclone Fence, Dept. 3108, Waukegan, Ill.

USS CYCLONE FENCE
UNITED STATES STEEL

SCIENCE

Watch Your Head!

What kills the passengers when an airplane crashes? to the non-scientific layman, that question might seem on a par with "What causes death to the fly when a fly-swatter mashes it?" But the Cornell Aeronautical Laboratory was interested in the scientific, not the common-sensible answer. If there is no fire, the Cornell investigators decided, the leading cause of death is cracked skulls. So the laboratory, backed by the Navy, set out to learn how a human skull cracks, and how to prevent it. Last week the experimenters described some of their findings.

Since they had to do without human skulls, the researchers, led by Edward R. Dye, started out with hens' eggs—which, Dye explained, are roughly equivalent, for experimental purposes. Both are about the same shape (ovoid), and both consist of a rigid, fragile shell containing gelatinous material. Eggs will break when dropped four inches on a hard surface, skulls about four feet. But skulls and eggs crack about the same way.

Dye and his associates made a gadget like a child's swing, put an egg in it, and swung it against a steel plate. When the egg was free to move (like a passenger with no safety belt) a very slight shock broke the shell. When held tightly, the egg survived harder shocks. When cushioned with rubber in front, it lasted even better. The hardiest eggs were snuggled against a cushioned block that slipped a little when the swing hit the steel, allowing the egg to come to a slow stop. It took a powerful shock to crack such a coddled egg.

Dye's group then developed a more realistic skull substitute. They made life-sized, head-shaped shells of brittle plastic and filled them with gelatin. They finally got an artificial human skull that reacted to shock almost exactly like a real one. Then they catapulted the models against solid objects resembling airplane parts that passengers' heads might hit in a crash.

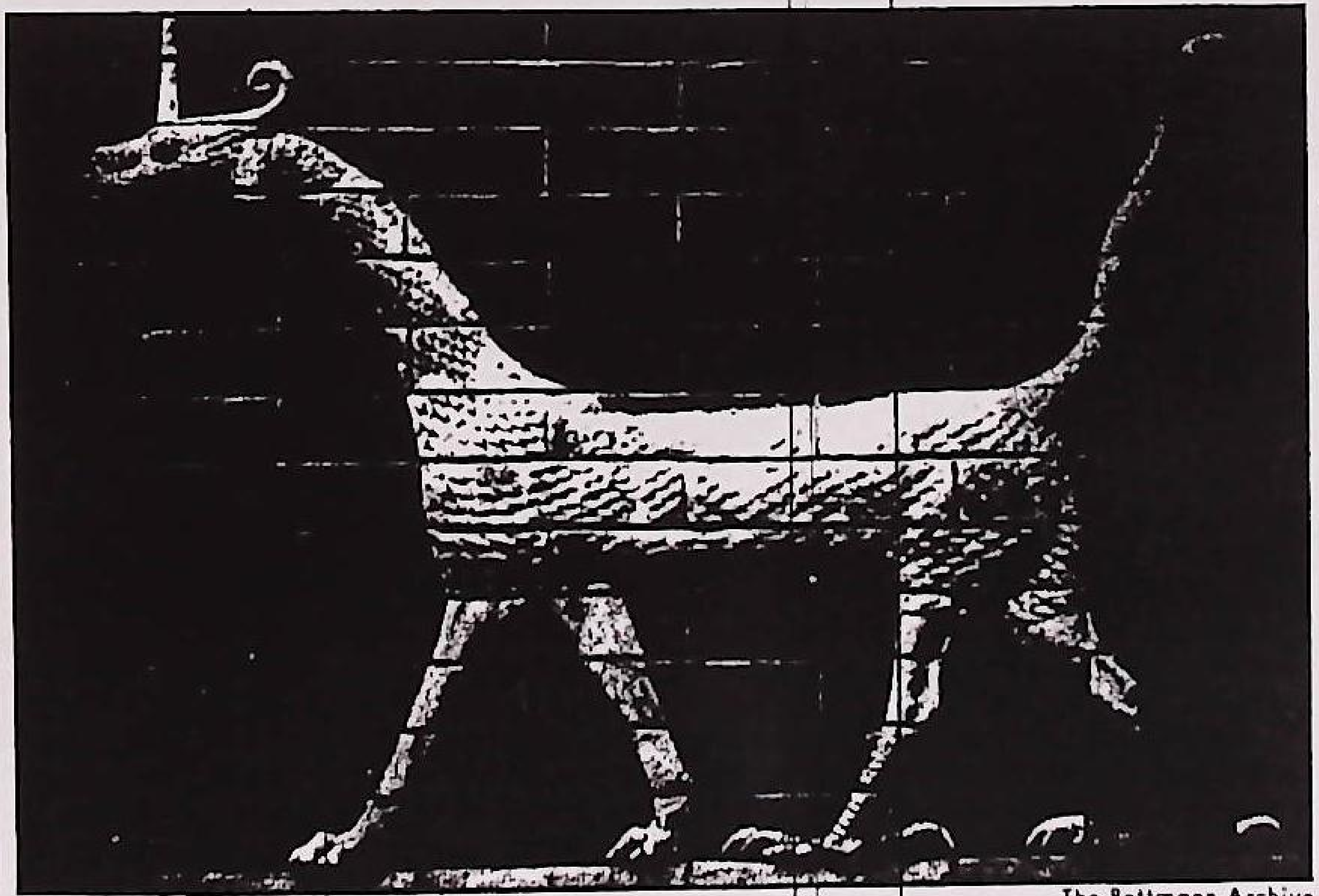
Out of these skull-cracking labors came a theory to guide designers of aircraft. An airplane that is easiest on skulls, Cornell decided, should hold its passengers as tightly as possible. The things that skulls might strike against should not be small, hard objects, but should be made of thin metal formed around broad shapes of yielding plastic foam.

Seats should be made so that they slide a little when the plane crashes. Also, the plane's nose should be made of material that yields gradually. The Cornell men believe that if all these principles were followed, a pilot could fly a small plane into the ground at 150 m.p.h.—and walk away with a skull somewhat addled but still uncracked.

The Romantic Zoologist

Big-Game Hunter Willy Ley* has returned from safari. Having tracked his prey through the dank undergrowth of large public libraries, he has put his trophies on exhibition in a newly published book, *The Lungfish, the Dodo and the Unicorn* (Viking; $3.75).

Ley calls his book "an excursion into romantic zoology." It is a lighthearted excursion. A man of deep zoological faith, Ley believes that animal myths are based on actual fact, and that many fearful and wonderful creatures, undreamed of (and


The Bettmann Archive

NEBUCHADNEZZAR'S SIRRUSH
Anybody seen a dinosaur?

---

* German-born Willy Ley is better known as a writer on rockets and interplanetary travel. His present book is an expansion of an earlier work, *The Lungfish and the Unicorn*, which became a war casualty when published in 1941.

LIFE EXTENSION
for OLD FLOORS

It's *easy* to resurface worn or broken floors. Less costly than you think, too. Just specify heavy duty asphalt mastic floors made with Flintkote Flooring Emulsions. Then watch a modern industrial floor take form . . . almost before your eyes.

These cold-laid mastic floors go down *fast*. They take normal traffic within 24 to 48 hours after application.

Almost any firm base is satisfactory . . . wood, steel, or concrete. And the result is a wearing surface that withstands the heaviest trucking . . . is quiet and comfortable underfoot . . . is dustless and easy to clean.

For underlayment beneath decorative flooring, you'll find mastic has many advantages, too. Quick, easy application. Added quiet, resilience and comfort. Increased protection both of sub-floor and finished surface.

Find out how mastic floors made with Flintkote Flooring Emulsions can help solve *your* flooring problems. Write today for full information.

Flintkote Makes Many Things

Automotive and railway specialties, adhesives, dispersions of rubber and resins, roofing, siding, insulation, packing cartons and product packages . . . these are only a few Flintkote products for homes and industry.

An experienced technical staff is at your service when special requirements necessitate research and development . . . ready to work independently, or in close cooperation with you. Let's discuss your needs. THE FLINTKOTE COMPANY, 30 Rockefeller Plaza, New York 20, N. Y.; 55th & Alameda Streets, Los Angeles, California; 30th Street, Long Branch, Toronto 14, Ontario.

FLINTKOTE PROTECTION

FLINTKOTE

BUILDING MATERIALS • PRODUCTS FOR INDUSTRY • PAPER BOXES & CONTAINERS

unlisted) by more unromantic zoologists, may still roam the earth.

Gentle Unicorn. The unicorn, King of (nonexistent) Beasts, was reputed to be a graceful, strong animal that could not be taken by force. But like the "gentil knights" of the troubadours' verses, it would lay its head in a virgin's lap. A pity, says Ley, to believe that the unicorn is only an ugly rhinoceros, dimly and distantly seen. Perhaps the noble beast had a pleasanter prototype. Modern scientists know, Ley points out, that the horn buds of a calf can be transplanted to the middle of its forehead, where they develop together into a "unicorn" (single horn). The bull with such a horn becomes the leader of the herd. Confident of his strength and position, he can afford to be as gentle as a unicorn.

Evil Kraken. Another mythical beast, says Ley, has really come to life: the kraken, a gigantic octopus that flourished in the imagination of medieval Scandinavians. Evidence has been accumulating, he says, to prove that there are several species of giant squid or octopus which come to the surface only rarely. Ley thinks that Scylla, of the *Odyssey*, must have been a kraken, with her six toothy necks reaching out of a sea cave. So was Medusa, with her "snakes" (octopus arms) writhing around her face.

Ley believes in sea serpents too; he marshals an impressive panel of ministers, sea captains and other reliable witnesses to testify that they exist. They are not "serpents", he thinks, but some large reptile or mammal from an earlier age.

There are other strange beasts in the sea, says Ley, that zoologists do not recognize. For example, there is a turtle-like creature, much bigger than known sea turtles, called a *ninhi* in Easter Island and a *moha-moha* in Queensland. It may range all over. Last winter, says Ley, a large unknown animal tried to climb a sea wall in Florida, leaving great *moha-moha*-like tracks in the sand.

Modern Dinosaur? Are any dinosaurs still around? Ley tells of the Ishtar Gate in the ruins of Nebuchadnezzar's Babylon, which is decorated with portraits of the *sirrush*, a scaly, tall-walking reptile with clawed hind feet like a bird. The drawing is singularly detailed, and like nothing known to modern man until he dug up fossil dinosaurs. Ley thinks that the ancients may have seen something like a living dinosaur. Perhaps modern man may still see one. Ley cites many descriptions of a dinosaur-like creature that may be roaming the Central African swamps.

There may be anthropoid apes in Venezuela, Ley says optimistically, and little furry men in Africa. Ley admits that the dodo, most extinct of birds, is gone for good—and so is the great auk.

But more living fossils, he says, may turn up any day. Not ten years ago, South African fishermen caught a *latimeria*, a large primitive fish that was supposed to be extinct 60 million years ago. Who knows what fossils may yet come to life—what myths turn to fact? Meanwhile, zoology is richer for Willy Ley's researches.

MAGAZINE: ASTOUNDING SCIENCE FICTION
DATE: MARCH 1938, VOLUME XXI NUMBER 1
SECTION: SCIENCE FEATURE
ARTICLE: POWER PLANTS OF TOMORROW
AUTHOR: WILLY LEY
PAGES: 108-112.

ON SALE THIRD WEDNESDAY OF EACH MONTH

ASTOUNDING SCIENCE-FICTION

Volume XXI Number 1
March, 1938
A Street & Smith Publication

Title Registered U. S. Patent Office
The entire contents of this magazine are protected by copyright, and must not be reprinted without the publishers' permission.

NOTICE—This magazine contains new stories only. No reprints are used.

Novels:

SOMETHING FROM JUPITER . . . . Don Elstar 6
They weren't remotely human—they were built of ammonia instead of water—but the human found they understood one feeling—gratitude.

THE MASTER SHALL NOT DIE! . . . . . . R. DeWitt Miller 38
A thousand years he lived, while his friends died away about him. Thirty men had died for him—and the civilization he made possible. So—he dared not die!

EYE OF THE PAST . . . . Eando Binder 142
Presenting a new theory of time-vision—and the thought that Man's disarmament might be a prelude to——

Short Stories:

FLIGHT OF THE DAWN STAR . . . . . Robert Moore Williams 26
Two men lost in infinity—who forgot that there is more than one infinity——

DUEL IN THE SPACE LANES . . . . . . William C. Beckett 56
Commercial warfare enlists an inimical people——

WINGS OF THE STORM . . . . Manly Wade Wellman 88
A curious little man seeks the Storm-bringer. An unusually fine little fantasy.

MARTYRS DON'T MIND DYING . . . . . John Victor Peterson 97
A story of mind-maddening confusion brought by time-travel.

VIBRATORY . . . . Warner Van Lorne 119
A solid steel beam vanishes—and comes back firmly holding a captive of another world.

FLAREBACK . . . . Kent Casey 132
Introducing Kent Casey, an interesting new author, Sergeant John West, a ruminative space-soldier, and Dr. Von Theil, a scientist with much sense, but no sense of dignity.

Serial Novel:

JASON SOWS AGAIN . . . . Arthur J. Burks 64
A general is given the greatest military weapon of all time—and no way to use it to defeat his overwhelming enemy!

Science Feature:

POWER PLANTS OF TOMORROW . . . . Willy Ley 108
The last of the short series on future power sources—Putting the Moon on the Job.

Readers' Departments:

IN TIMES TO COME 4
EDITOR'S PAGE 37
SCIENCE DISCUSSIONS AND BRASS TACKS 113

Cover by Wesso. Illustrations by Wesso, Dold, Binder and Schneeman.

Single Copy, 20 Cents Yearly Subscription, $2.00

Monthly publication issued by Street & Smith Publications, [illegible] New York, N. Y. Artemas Holmes, President; Ormond V. Gould, Vice President and [illegible]; Gerald H. Smith, Secretary; A. Lawrence Holmes, Assistant Secretary. [illegible] Inc., New York. Copyright, 1937, by Street & Smith Publications, Inc. [illegible] at the Post Office at New York, N. Y., under Act of [illegible] September 13, 1933. [illegible] Cuba, Dom. Republic, Haiti, Spain, Central and South American [illegible] $2.25 per year. To all other Foreign Countries, including The [illegible]

We do not accept [illegible] 16

To facilitate handling, the [illegible] postage attached.

STREET & SMITH PUBLICATIONS, INC., [illegible] AVE., NEW YORK, N. Y.

ANN
of New C

OPEN TO MEN AND WOMEN

COUP

①
②
③ STATE
AUTO
④ CAN YOU
AT

ALL APPLICAT
WILL BE
HELD STR
CONFIDEN

Power Plants of Tomorrow

by

Willey Ley

The last of a short series of science articles on future power sources—"Putting The Moon on The Job"——

THE waters of the seas are alluring. They promise travel, adventure, danger and thrills. And—they promise wealth, too.

Once it was the wealth of pirate loot or of jetsam, amber and pearls. Now we are seeking a more precious wealth in the waters of the seas. It is neither pirate treasure nor the gold dissolved in the waves; it is power. The waves of the seas, the winds of the seas, the tides of the seas—almost anything that has to do with salt water abounds with power. There is power in the difference between the temperatures of surface water and of ground water in the tropical seas, and there is power in the difference between the temperatures of the water of the Arctic Ocean and of the ice floating upon its surface.

Every one of these possible sources of power has been investigated theoretically, and it has been found that every one of them is large enough to furnish all the power needed by civilization. The question is how to harness these powers, and how to harness them efficiently. Not all the various sources of power offered by the seas are equally useful, because not all of them are steady enough for the needs of industry. A hundred years ago it may have been a good excuse for not running the mill because there was no wind blowing for a week or so. In our time we cannot waste time waiting for favorable weather. Our sources of power have to be reliable and steady.

Although wind is proverbially unreliable, there are still many engineers that busy themselves with the problem of harnessing wind power. The problem looks easy—it apparently only calls for a sensible application of the laws of aerodynamics to the old windmill.

There is such a "modernized windmill" running and generating electric power since 1931 near Balaklava, Crimea, USSR. It looks odd for some reason, somewhat resembling an airplane that crashed on top of an oil well and broke its wings. But this modern development of the old, picturesque windmills works well, does not have to have many repairs, and generated approximately 200,000 kilowatt hours per year since it was built. Therefore one can understand that the Russian experts are quite satisfied, and plan a much larger power plant of the same type. They are well acquainted from experience with the unreliability of the wind, however, and do not propose to use the power they expect to harness for any work that has to be done on schedule. It must be hard to find such work in Russia.

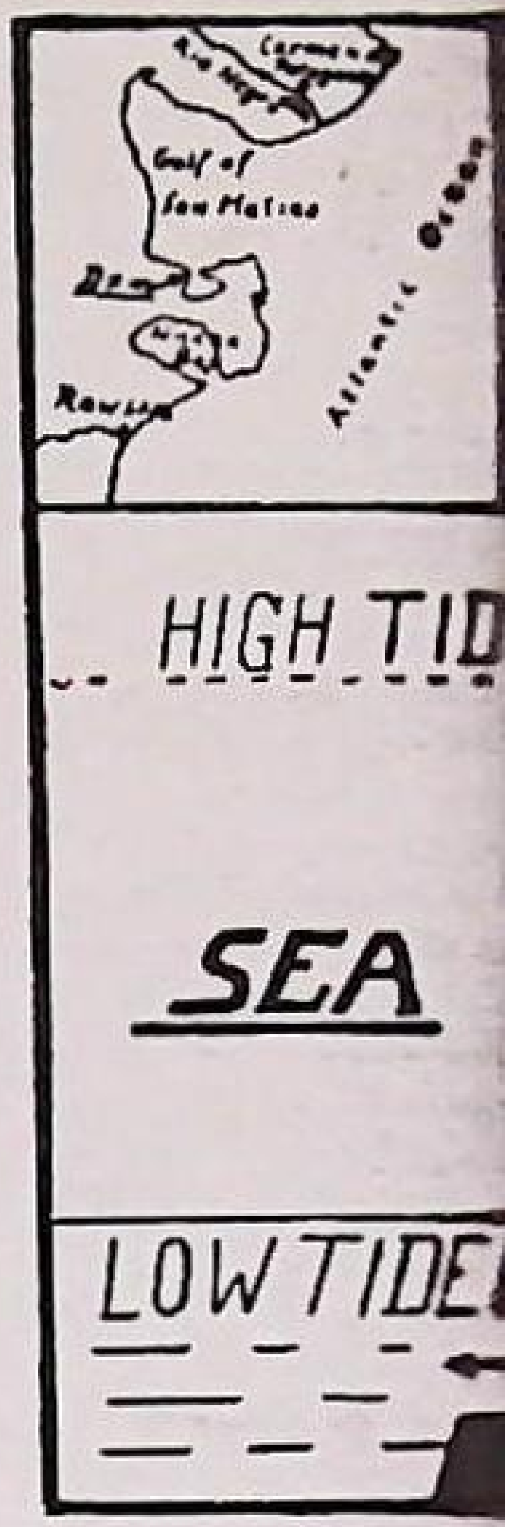


Diagram of p
gates are so
direction of

Another inte
nessing wind p
in France in
tories of Saint
looks very
power plant.
treme simplicity
chimney with
around its mou
any direction
fect, which
mounted wind
bine is placed
chimney. The
device has an ef
it represents "
In any event,
power engine
cessfully avoids
ing inefficient
actly toward th
Anything tha
been said, aga
applies to the
engines that
so many inven

of

r

es on future
he Job"——

a week or so. In
vaste time waiting
. Our sources of
ble and steady.
proverbially un-
l many engineers
with the problem
ower. The prob-
parently only calls
on of the laws of
d windmill.
nodernized wind-
enerating electric
near Balaklava,
looks odd for
at resembling an
on top of an oil
wings. But this
of the old, pic-
ks well, does not
epairs, and gen-
200,000 kilowatt
vas built. There-
d that the Rus-
atisfied, and plan
lant of the same
acquainted from
reliability of the
not propose to
ct to harness for
o be done on
ard to find such

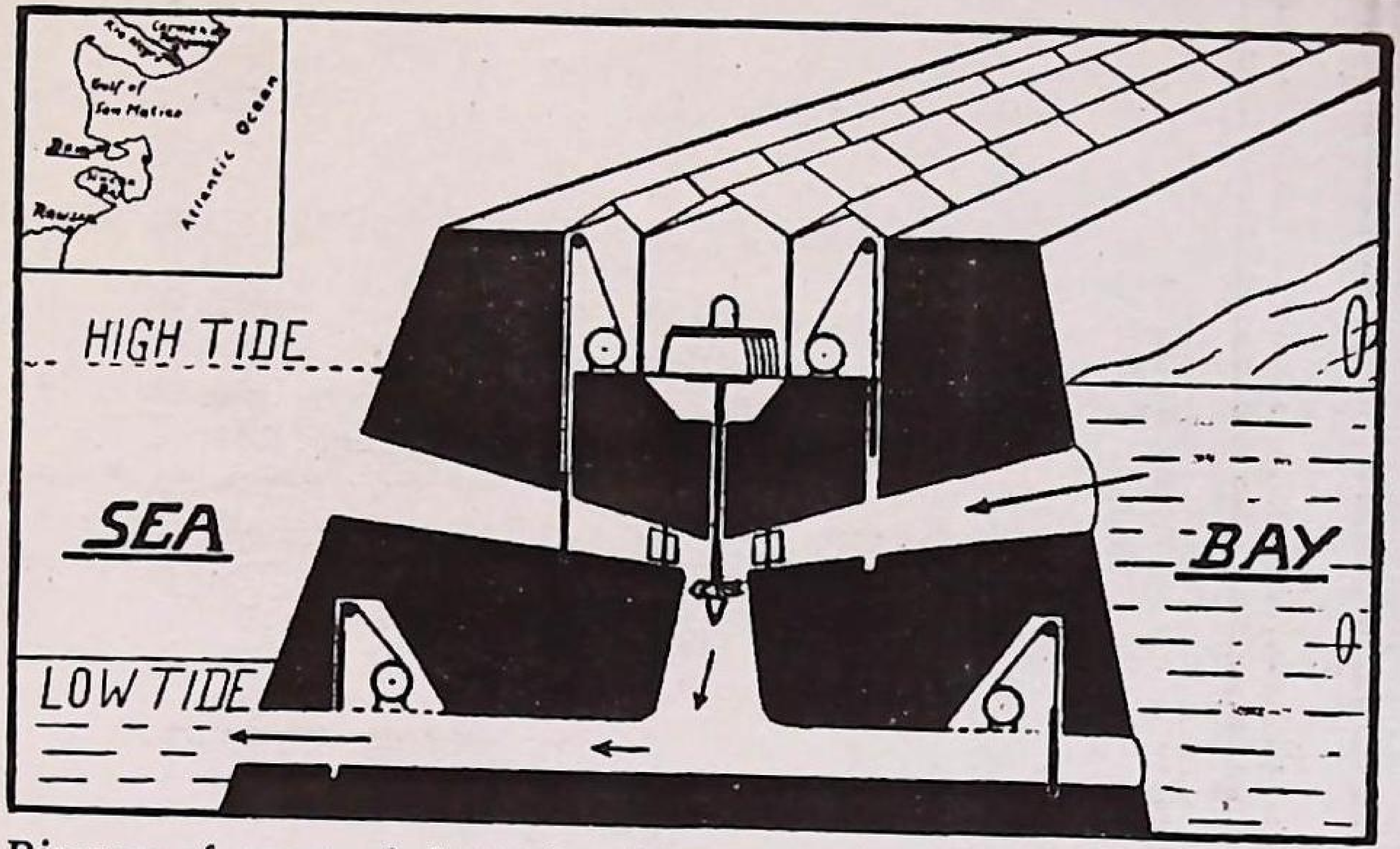


Diagram of proposed Argentine tide-power plant. Note that the control gates are so arranged that, whether bay or sea has the higher level, the direction of flow of water past the turbine blades may be made the same.

Another interesting means of harnessing wind power has been developed in France in the aerodynamic laboratories of Saint Cyr. Oddly enough, it looks very similar to Dubos' solar power plant. Its construction is of extreme simplicity. It consists of a metal chimney with a wide collar attached around its mouth. Wind coming from any direction will cause a suction effect, which makes a horizontally mounted wind turbine turn. The turbine is placed in the lower part of the chimney. The French claim that this device has an efficiency of 100% and that it represents "the perfect wind tower." In any event, it is the simplest wind power engine yet invented, and successfully avoids the disadvantage of being inefficient if it does not point exactly toward the direction of the wind.

Anything that can be said, and has been said, against wind power plants applies to the fullest extent to the wave engines that have been conceived by so many inventors. Wave power plants seem so very easy in principle—a number of floating pontoons anchored along a bridge construction equipped with levers that transfer the up-and-down movement of the pontoons, to a shaft, constitute the driving force. The shaft then turns a pumping mechanism which pumps water into a reservoir situated near by in an elevated position. The conversion into electric power is then accomplished by a normal water power plant.

THEORETICALLY, there are but few difficulties to make the power of the waves steady in this manner. Actually, such a power plant would suffer many losses, such as friction of the various levers and gears, and evaporation from the open reservoir, to name but a few. One may dismiss consideration of these obstacles in view of the magnitude of the power available. Still, it has to be admitted that the power would not be reliable unless the power plant is built at a seashore, where there is heavy sea almost every day of the year, and where at the same time a large natural reservoir considerably higher than sea level is available. Doubless there are shores that fulfill all these conditions, but they are rare and the majority of them are situated in places where there will be little need for power within the next few centuries.

The reproach of unreliability does not apply to the projects that work with a difference of temperature, either between surface water and ground water of a warm sea, or between surface ice and the water underneath a cold sea. The latter project is connected with the name of the physicist Doctor Barjot, the former has become known mainly through the experiments of Professor Georges Claude.

While Barjot's plans have not yet progressed beyond the stage of calculation and investigation, Claude was fortunate enough to be able to make quite extensive practical experiments on a rather large scale.

Claude's idea is to utilize the difference in temperature between surface water at about 30°C. and ground water at about 10°C. or lower to drive a low pressure steam engine or steam turbine. But it is not really his idea. It was suggested for the first time by Professor d'Arsonval in a paper published on September 17, 1881, in the *Revue Scientifique.*

At that time, not much attention was paid to the suggestion although d'Arsonval was a famous physicist. In November, 1926, Professor Claude and P. Boucherot jointly submitted a report to the French Academy of Sciences which dealt with experiments made with working models of a low pressure power plant operating on a temperature difference of only 15°C. Some time later this model—or a similar one—was demonstrated to the members of the Academy, and in April, 1928, Claude and Boucherot put the finishing touches to a power plant near Ougrée-Marihaye (Belgium) which was visited by many interested scientists. The turbine worked well and generated about three times as much power as was consumed by the auxiliary machinery necessary for the novel arrangement. A still larger experimental power plant on the northern shore of Cuba followed. Claude had much bad luck with this plant. Twice, the mile-long tube that was to bring cold ground water to the surface was lost or ruined, and when the plant was finally finished it was found that the auxiliary machines used up more power than was generated by the turbines and dynamos.

The experiments at Matanzas da Cuba were a complete failure as far as this particular venture was concerned, but they did not disprove the feasibility of the principle. In fact, Claude was not discouraged, and had the French steamer *Tunisie* rebuilt for his purposes. Much of his trouble had been caused by the fact that the floor of the sea sloped downward very gradually, which necessitated a tube 2000 meters in length to reach a depth of about 700 meters. Dangling from the ship, the tube could be much shorter, since it could be made to stand practically vertical in the water. This reduced the power lost in pumping the cool water. Surprisingly enough, the new power plant was not a great success either. There was always trouble with the long tube and with the auxiliary machinery.

WHEN these failures of the application of a sound principle became known, the Germans, Wilhelm Schmidt and Dr. E. Bräuer pointed out that they had published (independent of each other) treatises on very similar power plants in 1922 and in 1924 respectively. Both of them had apparently known of d'Arsonval's paper, and had not deviated from his suggestions as had Claude. If their scheme (which involves the use

---

of liquids of lo
of water in a pa
Claude) were
auxiliary pump
become obsolete
the plant suffic
ticable.

Dr. Barjot's
the same, but
temperatures.
Claude-Schmidt
a "hot" liquid
one of about 8
use water of
"hot" liquid, an
than 20°C. be
proposed powe
mendous advan
lished in regio
source of powe
tube that anno
jot's water tub
reach through t
at most.

Claude's pro
is actually a so
ficulties encou
periments sho
means easy to

But what ab

Everybody
the tides. Th
that we can
ergy if we suc
on the job to

Primitive ti
isted about a
first watermill
of the tides a
the eleventh c
problem has
the imaginati
needed the
power engine
ideas for seri

Probably th
tric tidal pow
near Husum,
engineer fro

of liquids of low boiling point, instead of water in a partial vacuum, as tried by Claude) were followed, some of the auxiliary pumps and condensers would become obsolete, which might simplify the plant sufficiently to make it practicable.

Dr. Barjot's suggestion is essentially the same, but works with still lower temperatures. While the d'Arsonvale-Claude-Schmidt-Bräuer project applies a "hot" liquid of 30°C. and a "cold" one of about 8 or 10°C., Barjot wants to use water of only about 4°C. as his "hot" liquid, and cold air, or ice, at more than 20°C. below freezing point. His proposed power plants have two tremendous advantages: they will be established in regions where there is no other source of power, and they lack the long tube that annoyed Claude so much. Barjot's water tube is only long enough to reach through the ice a few dozen meters at most.

Claude's project, as well as Barjot's, is actually a solar power plant. The difficulties encountered in the various experiments show again that it is by no means easy to harness solar power.

But what about Lunar Power?

Everybody knows its manifestation—the tides. Their power is so enormous that we can afford to neglect solar energy if we succeed in putting the moon on the job to supply our energy needs.

Primitive tide power plants have existed about as long as windmills. The first watermills running with the stream of the tides are mentioned as early as the eleventh century, and since then the problem has again and again tempted the imagination of inventors. But it needed the development of electrical power engineering to ripen the various ideas for serious discussion.

Probably the first experimental electric tidal power plant was built in 1913 near Husum, on the North Sea, by an engineer from Hamburg, E. F. Peine. Peine planned several large tidal power plants. The small experimental plant near Husum was only to answer certain questions frequently brought up in scientific meetings. The small plant was a complete success; all the assertions Peine had made were proven to be correct. Unfortunately, the work was interrupted by the World War, and was not resumed afterward in Germany.

But other countries began to pay attention to the "new" method to win power from other sources than coal and oil. Soon after the war, a medium-sized tidal power plant was installed at the mouth of the river Diouris in the Betragne, France. Naturally, tidal power plants work intermittently; therefore the French plant was coupled with another power plant six kilometers upstream. Both together furnish the current needed in the arsenals of Brest, the nearest larger town.

It seems that tidal power plants will be of great importance in the near future. There are only minor practical difficulties to be overcome. But they do have the big drawback that their power is not steady. The best of many possible solutions for this drawback seems to be the one that has been suggested for steadying the power of wave power plants. As long as the tides are running in or out there will be some excess power that can be used to pump water into an elevated reservoir. This then helps to supply the demand during the comparatively short pauses between the tides. It is true that this auxiliary power plant increases capital expenditure in an unpleasant manner, but there is no other way to do it. The other methods of storing electric energy are still more expensive.

THE LARGEST project among the many that have been made is still the one that was announced several years ago in England. There is usually a very high tide at the mouth of the river Severn where it empties into Bristol Channel. The project called for damming Bristol Channel near Beachley, for building a long-needed railway bridge close to the dam, for creating an artificial lake near Tintern by draining the river Wye and for installing a power plant of about half a million horsepower. The probable costs of this gigantic project were estimated at 30 million pounds.

The project soon found severe criticism and finally it was decided not to continue until a number of technical questions were solved. For this purpose, a small experimental plant was built in the vicinity of the planned dam. The engineers that constructed it tried to find a solution for storing the power other than in an artificial lake. For auxiliary power they used a steam power plant with electrically heated boilers. They then constructed a large heat-insulated storage boiler to store steam. If this method works out as well as it is hoped by its inventors, it will be an important step on the way to efficient tidal power plants.

Of the many other projects, only the one of San José Bay in the Argentine shall be mentioned. Conditions for a tidal power plant are ideal in this spot. San José Bay has an area of not less than 780 square kilometers, but to dam it, a dam only seven kilometers in length would be necessary, because its mouth is very narrow. At the same time, there are always strong and high tides to be found in the Gulf of San Matias. And, since the bay south of San José Bay, Nueva Bay, gives access to the same territory controlled by San José Bay, it would not even be necessary to put locks in the dam, which, of course, makes matters easier and saves much money.

It has been calculated that the dam could conveniently hold 376 sets of water turbines, coupled with generators. About 15 million kilowatt hours would be generated daily—twice this amount when there is spring-tide. The pauses between the tides would last only for one and a quarter hours, which could be bridged easily. Since the Republic of Argentine has to import several millions of tons of coal per year, one can understand that the government is very much interested in tidal power plants, and has had a number of other bays with similarly favorable conditions investigated for the same purpose.

The plans for "Lunar Power Plants," harnessing the energy of the tides, have doubtless progressed farther than any other plans for finding and harnessing new sources of energy. Only volcanic power plants have progressed beyond that stage; they are already in existence. If one compares the matter-of-fact language of tidal power plant inventors, with the many "if's" in the speeches of scientists trying to harness solar power, one feels like abandoning solar power altogether and putting the moon to the job instead.

Thomas Calvert McClary

Author of "Rebirth"

Brings a great new serial beginning in the
April Astounding——

"Three Thousand Years!"

THRILLING WONDER STORIES

VOL. XXXV, No. 3 A THRILLING PUBLICATION February, 1950

A Complete Short Novel

WHEN TIME WENT MAD

By DIRK WYLIE and
FREDERIC ARNOLD KUMMER, JR.

Webb Hildreth's future twin plunges him into an appalling shock area—while a damaged time machine weaves eras into an unstable pattern! 11

Three Complete Novelets

THE DANCING GIRL OF GANYMEDE ....Leigh Brackett 62
She was like a dream come to life—with hair of tawny gold and the glowing face of a smiling angel—but she was not human!

THE GREATER CONFLICT ....Raymond F. Jones 92
At last Cal Meacham of the Peace Engineers finds the answer to his problem, but he does not find it anywhere on Earth!

THE VOICE OF THE LOBSTER ....Henry Kuttner 114
Even the slickest of confidence tricks can backfire at times, but Macduff proves he's the most resourceful swindler in space!

Short Stories

DEAD RUN ....Cleve Cartmill 51
Jake Murchison and his gang fight to save a planet from atomic doom

SPECTATOR SPORT ....John D. MacDonald 81
The first man to reach the future, Dr. Rufus Maddon, meets a strange fate

THE SKEPTIC ....R. C. W. Ettinger 85
A wounded officer decides to find a way to exile human pain

PAYMENT IN FULL ....Ray Bradbury 135
They were three left of Earth's millions, three marooned on Mars!

Features

THE READER SPEAKS ....The Editor 6
WONDER ODDITIES ....Science Facts 61
THE FRYING PAN ....A Fanzine Review 156
SCIENCE FICTION BOOK REVIEW ....A Department 160

Published every other month by STANDARD MAGAZINES, INC., 10 East 40th Street, New York 16, N. Y. N. L. Pines, President. Copyright, 1949, by Standard Magazines, Inc. Subscription (12 issues), $3.00, single copies, 25c. Foreign and Canadian postage extra. Re-entered as second-class matter October 3, 1945, at the Post Office at New York, N. Y., under Act of March 3, 1879. Names of all characters used in stories and semi-fiction articles are fictitious. If the name of any living person or existing institution is used, it is a coincidence.

PRINTED IN THE U. S. A.

THE READER SPEAKS

(Continued from page 8)

you can look up quickly such things as escape velocity of Neptune, the name of r's third satellite, the reflecting power e earth or the exact length of the Martian Such facts are annoyingly hard to dig up you need one in a hurry—and what ce fiction and space-travel addict does not? ll this and Bonestell too! Can you afford to own it?

o which we can offer only a hearty n. THE CONQUEST OF SPACE is ond question the most magnificent pub- ing achievement in science fiction his- y. We recently had occasion to talk to Ley about his gorgeous collaboration. the course of the talk we mentioned the that we were having a difficult time ining possession of our review copy.

r. Ley sighed and said, "I know—I've a half dozen copies lifted myself."

Once in possession you may have to be- e a hermit to keep the book—but take it n us it's worth it.

OUR NEXT ISSUE

MURRAY LEINSTER once more steps into the lead-off spot in the April WS with a brilliant display of his inven- e genius in PLANET OF THE SMALL EN, a short novel which may well be stined for Hall of Fame honors at some ture date. For this is Leinster at his best a story of incredible space-spanning and e unbelievable creatures to be found on stant worlds.

Its action—and there is action aplenty— curs in an era when men have mastered terstellar distances as well as themselves d are engaged in utterly peaceful explora- on of the galaxy. They travel in yachts ther than destroyers and their interest not in conquest but in learning of the istence of far suns and planets and the ings, living and dead, upon them.

The *Carintha* is such a ship of peace- l exploration. It is piloted by Lon Howel d the company includes his fiance, Caryl, r father, a noted botanist, and Burton, noted interplanetary hunter. They are joying their jaunt through the space- ys when suddenly they are attacked by a ip from an ugly yellow planet, pursued rough overdrive to another distant globe d shot down.

But they do not crash. Some unforseen rce slows the fall of the damaged space- aft and they escape its wreckage just time to avoid annihilation by an atomic missile fired by their pursuer. They are trapped in a hopeless situation.

And then they discover or are discovered by the very human inhabitants of their new planet. Pygmies they are in size but it quickly becomes apparent that, descended from man's common ancestor, they have developed far beyond in culture, in science and, ultimately, in courage.

Their life is simple and casual but their devices are such as to keep the Earthly visitors goggle-eyed. And when the destroyers from the yellow planet return in force, bent on destruction, their methods of defense are as unusual as they are effective.

If you want to know how a garbage disposal unit can be used to check an atomic attack, how compressed air can be used for flight, how television can be used to conquer both time and space—you'll want to read this story. It is Murray Leinster in top vein—which is enough said.

James Blish takes over one of the novelet spots with THERE SHALL BE NO DARKNESS, a terrifying tale of lycanthropy (werewolfism to you) and its effect upon folk of today, gathered in an isolated country estate. His explanation of the phenomenon is as ingenious as his motivation and characterization are sound.

We have not run a story about lycanthropy in many years—not because we have not wished to but because the bulk of such stories submitted have been unbelievable to the point of the ridiculous. In THERE SHALL BE NO DARKNESS Mr. Blish has come up with a magnificent exception to this all-too-definitive rule.

Our second novelet should be, to many readers, the outstanding story of the issue, if not of many. JOURNEY FOR SEVEN by John D. MacDonald, whose new full length novel to appear in the May issue of our companion magazine, STARTLING STORIES, may well be the stf novel of the year, is a very different type of science fiction story.

It involves the driver and passengers of a battered bus who happen to be passing an atomic power plant when something goes a little wrong. They receive a full charge of the unpredictable power with some very astonishing results. Their reactions to a strange mutation and their effect upon society make this a powerful and welcome novelty in the field of pseudo science.

There shall be shorts—of course and in

MAGAZINE: PLANET STORIES
DATE: 1949 or 1950

THE READER SPEAKS

A DEPARTMENT FOR SCIENCE FICTION FANS

EXACTLY one month from today this magazine is going to have a new companion. The name of this soon-to-arrive member of the science fiction family will be announced soon and it promises to fill a long-empty gap in the field.

For many years now we have received—by letter, by telephone, by word of mouth direct and by virtually every mode of communication save carrier pigeon—laments over the unavailability of most of the great stories published from ten to twenty-five years ago during the so-called "formative" period of stf writing.

Few of these hundreds of stories have received the publication in book form—either as novels or as parts of the recent wave of anthologies—which guarantees a certain degree of permanence. For the most part the magazines which printed them have long since been consigned to the waste basket or the fireplace or have crumbled to illegibility.

In our current and well-loved companion, STARTLING STORIES, the Hall of Fame reprint feature has for eleven years brought some of the best of them singly to life. But this effort has barely scratched the surface of the huge backlog of magnificently imaginative stories that has too long been consigned to oblivion save in the bookcases of a scant-few ardent and faithful collectors.

Rich Pickings

Furthermore the limitations of the Hall of Fame have not permitted the reprinting of the longer stories, scores of which run to full book-length. Our new companion is to be a *big* magazine, one which will permit the publishing of at least one long novel per issue, as well as a goodly number of novelets and short stories. It promises rich pickings for avid fan and general reader alike.

Leading the opening issue will be Edmond Hamilton's unforgettable novel of the inner core of Earth, THE HIDDEN WORLD, one of the most imaginatively-stirring stories this still-very-active author has ever written. It will be backed by at least two novelets, VISIT TO VENUS by Festus Pragnell, and THE MAN FROM BEYOND by John Beynon Harris.

For the other stories and novelets the selection will be made from the best early works of such authors as Eando Binder, Stanley G. Weinbaum, Richard Vaughan, Raymond Z. Gallun, Fletcher Pratt and scores of others. This soon-to-appear magazine will provide not only magnificent stf entertainment in its own right but will provide modern readers with a chance to compare the very best from the allegedly "good old days" with current trends and craftsmanship in the field.

A Magnificent Volume

It has not been our custom to give over this space to the reviewing of current science fiction and fantasy books. But custom is created not only to be followed but to be shattered on occasion—and this looks to be a suitable occasion.

The cause is the recent publication of a magnificent volume of plates and printed matter by a pair of men who rate as greats not only with devotees of stf but with scientists themselves. We intended to review it here ourselves but a certain moderately

(Continued on page 8)

AUTO BOOKS ON APPROVAL

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books. 20th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this FREE EXAMINATION OFFER.

MAKE GOOD MONEY NOW
HOLD A PERMANENT JOB

America wants its automobiles kept in good repair. Men with "know how" are in demand, at big pay. These books will help you get and hold an important job, or give you a chance to go into business for yourself now or later. Any man who half tries to improve himself can learn auto servicing and repairing by this quick reference method. Use the JIFFY INDEX to find easily understood answer to any auto problem. These wonder books prepared by eleven of America's great automobile engineers. Many hundreds of valuable illustrations. Send the coupon TODAY.

CAN YOU FIX IT?
These wonder books tell step by step HOW to make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 BIG, THICK VOLUMES
Over 2700 pp., 2000 illustrations, wiring diagrams, etc. Beautiful modernistic, washable cloth binding.

A year's consulting privileges with our engineers now given with these books without extra charge. *Publishers Since 1898*

AMERICAN TECHNICAL SOCIETY, Dept. A-249
Drexel Ave. at 58th St., Chicago 37, Ill.
I would like to examine your 4-Volume Set of Auto Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you $2 and pay the balance at the rate of only $3 a month until $24.80 has been paid. Include consulting service as offered above.
Name ....
Address ....
City .... State ....
Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.

High School Course at Home
Many Finish in 2 Years

Go as rapidly as your time and abilities permit. Course equivalent to resident school work — prepares for college entrance exams. Standard H. S. texts supplied. Diploma. Credit for H. S. subjects already completed. Single subjects if desired. High school education is very important for advancement in business and industry and socially. Don't be handicapped all your life. Be a High School graduate. Start your training now. Free Bulletin on request. No obligation.

American School, Dept. H258 Drexel at 58th, Chicago 37

GET READY TO LIVE!

Will you gamble 1c to win happiness, bigger income, love? Why accept fear, uncertainty, shyness, miserable lacks? "Plenty for All Who Use Secrets of NATURLAW," is theme of inspiring 16-page book, MOUNTAINS OF GOLD. It's FREE! Win your share of life's good thru NATURLAW. Send name to

INSTITUTE OF NATURLAW, Dept. TS1620, 2208 Main, Dallas, Texas

OWN Your Own Business

Lifetime Income

Clean and Mothproof rugs and upholstery "in the home" or public buildings. Start full or part time. Gross profits up to $15 and $20 a day on EACH service man. Easy to learn . . . quickly established.

DURACLEAN cleans by absorption! No scrubbing, soaking or shrinkage. Dirt and grease vanish . . . matted pile rises . . . colors revive. Furnishings used again same day.

DURAPROOF resists moths, mildew and carpet beetles. Your service backed by a National Money Back 4 Year Warranty.

We furnish enough material to return your total investment. EASY TERMS. Send for FREE booklet . . . full details. No obligation.

PATENTED PORTABLE EQUIPMENT

DURACLEAN CO. 0-692 Duraclean Bldg. DEERFIELD, ILL.

THE READER SPEAKS

(Continued from page 6)

well-known science fiction author volunteered out of his own enthusiasm to writ us such a review.

We accepted gratefully and herewith giv you—

THE CONQUEST OF SPACE by Chesley Bonestell Willy Ley, Viking Press, New York ($3.95). Reviewe by Robert A. Heinlein.

This book could be reviewed in three words "*Go buy it!*"

Willy Ley's deft and lucid handling of the intricacies of space travel is not new to the TWS family. Chesley Bonestell's breath-taking astronomical and space travel paintings are certainly almost as well known to you. They have appeared in LIFE, Coronet, and many other places. Here we have them together, in a beautiful quarto volume. They go together like ham and eggs.

No matter how many times you have read Ley on space-ships, you will find this a fresh account, told with his usual easy humor. As to the Bonestell paintings, this is the first time they have been gathered in one place—and they take you all over the solar system, from a rocket fueling on earth to the eternal snow of Pluto, with frequent stops at all the way stations.

There is nothing like a Bonestell painting—they seem to be color photographs, taken impossibly before the fact. There are fifty-eight Bonestell plates in the book, twenty-three of them in fine four-color reproduction.

It will be tempting to take a razor blade to some of them and frame them, even though it would involve the violation of a beautiful volume. I had the good fortune to get a defective copy—"defective" in that the binding machine had duplicated sixteen whole pages of Bonestell plates. Naturally, I refuse to swap it. *I* can have framed copies without damaging my book! (Examine carefully each copy in your book store; the binder may have done it more than once.)

In addition to the pure joy of owning this beautiful and instructive book, there is another advantage. Perhaps you get tired of dunderheads who scoff at science fiction, the dimwit who picks up your copy of TWS and says, "You read *that* stuff?"

Slip him this book. Let him read it—if he can read. If not, let him look at the pictures. If there is anything in him to save you will have made a convert.

Willy Ley's text is in four parts—rockets and space ships, starting with a detailed account of a present-day firing at White Sands—a discussion of the Moon Rocket and the moon itself—a tour of the solar system—and finally a discussion of the little planetoids. He has thoughtfully included at the beginning a two-page tabulation of "vital statistics" about our family of planets.

This bonus is a valuable feature of the book;

(Continued on page 139)

MAGAZINE: AMAZING STORIES
DATE: MARCH 1940 VOLUME 14, NUMBER 3
FEATURES: WHAT'S WRONG WITH ROCKETS?
AUTHOR: WILLY LEY
PAGES: 39, 49, 127, 145.

MARCH
1940

VOLUME 14
NUMBER 3

AMAZING STORIES

Contents

STORIES

BLACK WORLD..........................by A. R. Steber............... 8
John Carver finds the path of duty isn't very clear when a whole solar system is shrouded in mystery.

THE STRANGE VOYAGE OF DR. PENWING by Richard O. Lewis........... 40
Einstein says the universe is curved, but Dr. Penwing had a ship that could travel in a straight line!

PAUL REVERE AND THE TIME MACHINE..by A. W. Bernal............... 50
Paul Revere couldn't change history. But how could he make that ride while stranded in 1940?

VAGABONDS OF THE VOID.............by Peter Horn................. 66
The Tuckies were happy when they found a world to call home, but it seemed too good to be true.

THE SCIENTIFIC PIONEER..................by Nelson S. Bond............. 88
There was something uncanny about the way Hank could answer problems that baffled science.

TERROR OUT OF THE PAST................by Raymond Z. Gallun......... 100
What was the purpose of this vast, ruined fortress, buried beneath the debris of a million years?

FEATURES

The Observatory.................. 6
What's Wrong With Rockets?...... 39
Riddles of Science................ 128
Meet The Author................. 129
Science Quiz.................... 130
Monthly Merit Award............ 132
Questions & Answers............. 133
Discussions...................... 134
Correspondence Corner........... 140
The Earth's Core.................. 144

Front cover painting by H. W. McCauley depicting a scene from Black World
Back Cover painting by H. R. Hammond
Illustrations by Robert Fuqua, Leo Morey, Julian S. Krupa, William Juhre, Joe Sewell

---

Copyright, 1940, ZIFF-DAVIS PUBLISHING COMPANY

Member of the Audit Bureau of Circulations
William B. Ziff, Publisher; B. G. Davis, Editor; Raymond A. Palmer, Managing Editor;
David Vern, Associate Editor; Herman R. Bollin, Art Director

We do not accept responsibility for the return of unsolicited manuscripts or artwork. To facilitate handling, the author should inclose a self-addressed envelope with the requisite postage attached, and artists should inclose or forward return postage. Accepted material is subject to whatever revision is necessary to meet requirements. Payment for manuscripts and illustrations will be made at our current rate.

The names of all characters that are used in short stories, serials and semi-fiction articles that deal with types are fictitious. Use of a name which is the same as that of any living person is accidental.

AMAZING STORIES MARCH, 1940

Published monthly by ZIFF-DAVIS PUBLISHING COMPANY at 608 South Dearborn Street, Chicago, Ill. New York Office, 381 Fourth Avenue, New York City. Entered as second class matter October 6, 1938, at the Post Office, Chicago, Illinois under the act of March 3rd, 1879. Subscription $2.40 a year (12 issues); Foreign, $3.40.

Volume XIV
Number 3

nd I'm going to
urned and ran
Carver stood
d in a turmoil.
ere when he saw
float away from

ing silver shape
wn up and swal-
s Ann Mitchell,
is shoulder and
e Stellar Patrol.
ripped them off
rop to the floor

ext month)
second and last
illing interplan-
l issue. What
Why has Profes-
ate? What sin-
mind of Franco
gineer? For the
ments you have
guarantee the
"Black World."
netary story of

hrough the six pages
e fans have thrown

ey can pick up the
ext broadcast of the

g on air" is rolling
tic chemistry's new-
mobile—tires made,

d for heating and
as when stripped of
und that, when its
chains, becomes a
iene *rubber!* While
rubbers as the Ger-
Neoprene," made re-
chlorine, butadiene
produce. It is al-
r!
ell at about 20c a
s 16c, *it wears three*
hy they're predict-
ll be riding around
—*Rap*

WHAT'S WRONG WITH ROCKETS?

By WILLY LEY

One of today's foremost rocket authorities gives us his viewpoint on the shortcomings of rockets.

ON October 14, 1935, an experimental all-metal rocket rose from a proving ground near Roswell in New Mexico and, driven by gasoline and liquefied oxygen, attained an altitude of 4,000 feet. On May 31, 1935, the same rocket had ascended to an altitude of 7,500 feet. It had been built and designed by Professor Robert H. Goddard.

A few years earlier, in July, 1933, a 220-pound all-metal rocket built by engineers of the German Rocket Society had made a flight near Magdeburg. It was flight No. 106 or 107 of the liquid fuel rockets constructed by the Society mentioned. At about the same time rockets built along the general lines of the German models by the American Rocket Society made flights at Staten Island.

But since then nobody—with the possible exception of Professor Goddard, who declines to speak—did very much actual work. Rocket research, that five or six years ago had been actively and vigorously pursued by quite a number of people in various countries, practically disappeared from current history and even the word itself does not mean much to most people except as the term for a device required in the plots of some comic strips. And those that do remember are apt to ask what was wrong with those rockets. Why was research abandoned just at that moment when those things called (partly for want of a better name) liquid fuel rockets had shown that, after all, they could fly? Did they not live up to the expectations of their designers, whatever these expectations may have been? And what were they built for, anyway?

As to the last question, I happen to know with aboslute certainty that they were not "attempts to reach the moon." Neither were they "forerunners of transatlantic rocket airplanes." And they also were not, as could be read occasionally in European newspapers, "future deadly instruments of war."

They were honest and very serious attempts to solve certain purely scientific problems and also to find out whether the principle of reaction against a jet of flame which motivates all kinds of rockets cannot be used to advantage for various purposes. Theoretical investigations had shown that rockets should be able to do a lot of things. But that same investigation had also shown that the existing commercial type of rockets, propelled by a tightly compressed "slow" powder-mixture was not efficient. It had shown, furthermore, that powder rockets never would be much more efficient than they are at present, in fact they were almost the most inefficient type conceivable, having only the two advantages of venerable old age and easy construction.

Thus various individual experimenters and a few groups of experimenters set out to build liquid fuel rockets. The crucial point in the beginning of the work was whether one could dare to inject liquid fuel from one tank and gaseous and/or liquid oxygen from another tank into the same combustion chamber without inviting inevitable disaster, at least for the rocket itself, possibly for all those nearby. Experts on liquid fuels and liquid gases insisted that explosions were inevitable. But Professor Oberth of the German Rocket Society (and, unknown to him and even a little earlier, Professor Goddard of Clark University) tried it and no explosion occurred. Explosions came later but then experimenters knew already that they occurred only if something was not quite right. If it had happened that the very first experiment had ended in a serious explosion—as was even likely since nobody knew anything of all the mistakes that could be made—rocket research might not have started at all. Then the liquid-gas-experts that had prophesied disaster would have been believed to have been right. Fortunately nothing serious happened and thus research was continued.

The actually flying liquid fuel rockets—at first only so-called rocket motors on fixed proving stands were tried—built later on did perform in accordance with theory and expectations, generally speaking. And even the most skeptical observer will admit that an entirely new device works pretty well if it climbs to an altitude of a little over a mile not quite two years after the first experiment during which time a groping and fumbling sort of research had to eliminate dozens of blind alleys before it could go ahead on the right way. In those experiments in which I took part it took a few weeks more than one year to see the rocket fly, counting from the day where the first sketch in a pocket notebook was drawn during a railroad ride. And in less than one year after that first flight small rocket models climbing to a half or a full mile of altitude were commonplace and shown to visitors on request while the big models were cooling off from test runs in another corner of the proving ground.

Why did progress stop just then?

In all the calculations that were made previous to an actual experiment there had invariably been

(Continued on page 49)

WHAT'S WRONG WITH ROCKETS?

(Continued from page 39)

"if" symbol. In this country that symbol would have been $, in England it would have been £, in Germany it was *RM* . . . meaning cash.

Progress in rocket research has been stopped by lack of funds and for no other reason!

Although that situation was always just around the corner—in more precise language: "We'll now go ahead with experiment 124 and 125 which will need two weeks, if there is no money coming in during that time we can't go on with 126"—it was not so very noticeable at first.

But a few words of explanation where money came from at all are, perhaps, necessary. Professor Goddard is working with grants from the Guggenheim Foundation and similar institutions, but he is the only one of all rocket experimenters who ever was lucky enough to get grants. Most of the experimental work was done by societies founded especially for that purpose (to get money for experiments) and since it furthermore was the most successful of all and, finally, since I as its vice-president for many years have knowledge of the facts it might well be used as an example.

The Society had been founded in 1927, at first mainly as a kind of scientific debating club, devoted to discussions of rocket research, of astronomy and some allied questions and to the publication of a monthly journal to further interest in those problems. Very quickly a part of the chest of the treasury was set aside for possible experimentation. After only a few months it was decided that special efforts should be made to accumulate money for experimental research. But before the amount became worthwhile a lucky combination of circumstances helped. The UFA Film Company decided to take a movie based on a rocket story plot. Professor Hermann Oberth, then president of the Society, was called for supervision of the scientific details and finally some research money could be extracted from the publicity department. Meanwhile the membership of the Society had mounted to close to a thousand people which promised a backing after the movie episode in the life of rocket research was over. Thus experimentation was boldly begun.

The Society finally did have the money to continue the research. Gifts of money, and even more important at that time, material and machinery came from a few well-to-do members, a proving ground was furnished by the city and a few idealistic engineers decided to work without a salary—just for shelter and living expenses—until steady financial support could be created somehow. Influential people at that time said that they, or the firms they represented, would back experimentation if it could be demonstrated that liquid fuel rockets could outfly powder rockets.

The scheme worked very nicely for one year and could, with some strain, be made to work for another year, then everything collapsed at once. The reason was then a little hard to perceive and now, in the light of after knowledge, it is not hard to explain.

Paradoxically enough the organization collapsed because its research had been successful.

I think it was Pascal who said that human knowledge can be likened to a sphere, the more it expands the larger the number of points where its surface touches the unknown. Unfortunately that applies to financial demands also.

In rocket research an experiment that failed meant only repetition under slightly changed conditions. It may have failed only because a poorly made welding seems opened up or because one certain plug and hole was not exactly straight. The financial expenditure connected with such a repetition on the same scale is bearable.

A successful experiment is a different story.

It does not mean one other experiment, but several, usually many of them. It means material, fuel, new designs, oftentimes new equipment to handle larger pieces of work, new and more sensitive (and much more costly) instruments for observation and record. Thus it finally meant that the financial requirements could not be met anymore by the sources and by the methods that had worked fairly well for some time, especially since it so happened that business conditions were getting worse and worse.

When that work had just been started and was in the first stages of progress imaginative people in other countries tried to further rocket research by imitating the German Rocket Society. Most successful, by comparison with other groups, was the American Rocket Society in New York that owes its existence mainly to the personality and perseverance of its first president, Mr. G. Edward Pendray, who came to Berlin for a visit early in 1931. The American Rocket Society did progress to actual experimentation, it made a fairly large number of ground tests with rocket motors on a proving stand and three flights. But that financial vicious circle I outlined above caught it even more rapidly than it caught the German Society.

Another promising group, the British Interplanetary Society in London has just found its end due to the War, about three weeks prior to the completion of their testing stand.

I have to state, however, that I do not believe that a Society, unless backed by a few very wealthy and very generous members, has a chance to progress much further than the German Rocket Society did. Besides experimental work under the auspices of a society is usually harried by the fact that the work to be done is decided upon by committees. Discussion and talk might clear up doubtful points and though it usually does not solve scientific problems might at least clarify them to such an extent that they attain definite shape. Too much talk, however, resulted in the premature death of two Russian rocket societies.

(Continued on page 127)

What's Wrong with Rockets?

(Continued from page 49)

It is, in fact, more likely that good results will be obtained if one man is put in a position to work alone with only a few assistants along one single line of research—even though it may not be the famous and mostly unknown "line of least resistance"—than if three presumably brilliant men handicap each other. The result in that case is at least loss of time and inefficiency, often worse.

Such a statement naturally gives rise to the question: what amounts of money are needed to carry on? To answer this it is not only worthwhile but even necessary to state in condensed form what has been achieved already and what should be achieved next.

The work already done consisted of finding ways and means to handle the theoretically advantageous liquid fuels, to show that rocket motors can be made to work, to work with sufficient power and to work for sufficient length of time. That length of time is surprisingly short; one or two minutes are long enough for most purposes, actually rocket motors have been made to stand the terrific strain of the continuous explosion going on inside of them for twenty-five minutes. The power or thrust exerted was also promising enough; it remains only to increase efficiency.

Fortunately that cannot be very difficult to do, because there exists no simpler engine than a rocket motor. It consists of only three parts, the injection nozzles which force continuous streams of fuel and oxygen (and, in some constructions, a cooling medium) into the second part, the so-called combustion chamber where the mixture is ignited and burned to escape through the third part, the exhaust nozzle. To increase the efficiency of that assembly one must *not* do one thing, one must not make it more complicated. The secret is one of proper shape and size, to be determined experimentally after theoretical investigation has ruled out those shapes that certainly do not work.

Aside from the rocket motor a liquid fuel rocket consists of two or three tanks, one for fuel—gasoline, alcohol and light oils have proved themselves to be very good, efficient and reliable rocket fuels—one for liquid oxygen and the third for compressed nitrogen to force the contents of the other two tanks into the rocket motor. The tanks are usually tubular to decrease air resistance and are grouped either in the form of a triangle or in one straight line. There are a few stabilizing fins placed in a convenient position and somewhere there is a compartment for a small parachute with a simple device for ejecting it at a set time.

The whole thing works in the following manner: After nitrogen pressure has been brought to bear down upon the liquids, and the valves that block the fuel lines to the motor are set to be released simultaneously, the ignition system is made ready. It usually consists of a jet of flame produced by a blow torch fastened to the launching rack and playing just underneath the exhaust nozzle of the rocket. Then the fuel valves are released, fuel and oxygen shoot into the combustion chamber and, coming out through the exhaust nozzle, catch fire. Unlike an internal combustion engine with pistons a rocket motor does not require continuous ignition, once ignited it works until the fuel supply is exhausted or cut off. The rocket then rises from the launching rack, fairly slowly at first but accelerating steadily. As long as the rocket motor works the speed increases although not exactly according to the rate of acceleration. On the one hand the acceleration increases because the weight of the rocket decreases (due to the consumption of the fuel) while the thrust of the rocket motor remains the same, on the other hand the air resistance grows with mounting speed. All these factors can be calculated however, and calculation as well as actual experiment have shown that, generally speaking, the speed of the rocket is highest at the moment the fuel supply is exhausted. Therefor the rocket does not fall back as soon as there is no fuel left. It then behaves exactly like a projectile fired from a cannon. It continues to rise until air resistance and the influence of gravity stop it. It is for that moment (calculated in advance to within seconds) that the clockwork mechanism of the parachute ejector had been set. It started to work automatically when the rocket pulled out of the launching rack. The return is then simply a matter of dropping by parachutes.

Such a performance, which might be termed the "natural" performance of a liquid fuel rocket, lands itself without strain for meteorological research. Many branches of modern activity are tremendously interested to know what happens in the stratosphere. Aviation likes to learn about it for the direct purpose of stratosphere flight. And since it is more than likely that conditions in the stratosphere influence or even control the weather in lower layers, the results of stratospheric exploration will in all probability be of great value to navigation, to ordinary aviation, to agriculture and to every other activity concerned with or influenced by the weather.

There exist many good instruments that are perfectly suited to inform us about conditions in the stratosphere. But they have to experience these conditions first, in other words they have to be brought up beyond, say nine or ten miles. Stratosphere balloons can do that and have done it, but they are risky and tremendously expensive. So-called "pilot balloons," small un-manned balloons that carry a bundle of instruments, burst at the ceiling of their flight and return the instruments by parachute, can do that too. But although they are inexpensive they are unreliable as well, being carried by the wind in whatever direction it happens to blow. Many of them are lost completely and the altitude they reach can never be predicted. These instruments

(Concluded on page 145)

inner world would attack him, since he would be alien, and since life in such a world would depend on strife for its existence.

Like a hothouse, this inner world would produce giant fungus-like growths, and tremendous toadstools and mushrooms would sprout everywhere, more than likely poisonous.

Certainly, this inner hollow of the earth would be nowhere near as ideal as the outside. It would not be a comfortable, or desirable place to live. In fact, it is to be doubted if mankind could even live there, even under advanced scientific conditions. It would mean a constant, unrelenting warfare against a savage world.

In a constant temperature such as must exist in an enclosed world, there would be no such thing as rainfall. There would be only a tremendous and constant precipitation of dew. Temperature changes are necessary to cause rainfall. There would be no clouds, constant central-sunshine, and unremitting heat. The only precipitation would be at the opening, resulting in a snowstorm at the pole. Is this where we get our polar caps?

That's the theory. You can take it or leave it.

WHAT'S WRONG WITH ROCKETS?

(Concluded from page 127)

for pilot balloons weigh from two ounces to about two pounds. Even the experimental rockets already built could easily carry three pounds of additional load. They weigh about twenty pounds themselves, being approximately nine feet long and having a diameter of two inches. A rocket designed to reach an altitude of say fifteen miles would have to weigh around fifty pounds, if constructed in the same manner as the experimental models it would have to have a diameter of about three inches and to be about fifteen feet long. To attain the fifteen mile altitude from sea level about three minutes would be needed.

Compared to sounding balloons such a rocket would have the advantage of having a predictable altitude. The instruments would experience drift only during the descent by parachute—if necessary they could be traced by a small wireless device built into the rocket—and would be ready for examination in a much shorter time since the rocket climbs much more rapidly. And while a bursted sounding balloon is worthless the rocket, which returns with the same parachute, needs only cleaning and re-fueling to be ready for another ascent, at an expenditure of about $12.00.

The point is that fifteen-mile rockets do not yet exist. To build them would need some more research and a few intermediate stages. The one-mile rockets that existed five years ago would have to be reconstructed, then to be enlarged to three-mile rockets, five-mile rockets and finally to fifteen-mile rockets. Fortunately things get much easier as soon as the six-mile altitude is passed.

After all this the question about the capital needed can be answered. To make the first five-mile ascent would require some twelve to fifteen months of research work, to do the rest would need not quite another year. A very careful estimate of the expenses for such work (leaving some margin for possible minor accidents and setbacks) which I made sometime ago resulted in a budget of about $1500.00 a month for the first twelve months and about $300.00 more per month for the second year.

This is not a tremendous amount of money but it is far beyond the possible means of a society. A society that were to spend about $20,000.00 a year on research would have to have between 15,000 and 20,000 paying members, each paying $3.00 membership dues a year. It seems that there are not yet 20,000 people in the world that know enough about rockets and think enough of the importance of rocket research to support such a society for a number of years.

Of course there are a few other possible ways. The most promising of them seemed to be advertising since successful rocket ascents should attract considerable publicity. After all, even a five-mile shot would mean an altitude record for rockets and therefore have some "news value."

Of course, seen from the standpoint of a scientist the ethics of science would benefit more if the money were forthcoming from some private individual who could, incidentally, achieve considerable personal fame as the result of his connection with the work. But as the good old Latin saying "non olet," meaning "(money) doesn't smell" implies, rocket research could digest the "disgrace" of being an advertising medium. If the inventors of printing presses and the wizards of wireless don't mind I fail to see why the masters of rocketry should be more squeamish.

But a good many efforts made in that direction failed to bring results. Not that my word as to the possibilities were doubted—I counted only one exception who doubted that *anything* new could be invented—the results already achieved were proof enough for that. Only a few declared that the sums of money involved were too large. *But none was willing to wait for two years!* I cannot tell why, although I often asked that question. The reasons given were different, probably not all of them truthful. But no matter what the real or pretended reasons were, the fact remained that nobody wanted to wait. Three months, if necessary even five, yes. Fifteen months or a year, no!

And that is what is wrong with rockets.

However, I do not worry about the future. For many years people could have asked: "What's wrong with airplanes?" Before that time they could have asked: "What's wrong with aluminum?" And there was a time when that question applied to automobiles and even to railways. Every one of these inventions and industries experienced a period when one could not tell whether they would live or die. They all lived and proved to have a future. So will rockets!

MAGAZINE: AMAZING STORIES
DATE: MARCH 1940 VOLUME 14, NUMBER 3
FEATURES: WHAT'S WR

DISCUSSIONS

AMAZING STORIES will publish in each issue a selection of letters from readers. Everybody is welcome to contribute. Bouquets and brick-bats will have an equal chance. Inter-reader correspondence and controversy will be encouraged through this department. Get in with the gang and have your say.

NO CINCH

Sirs:

This is my first letter to AMAZING STORIES, and as a matter of fact, to any science-fiction mag, and if I convey one thing, I'd like to say that in my opinion, AMAZING is the best of the mob. And, brother, I read 'em all.

However, the Discussions column bores me no little, simply because the fans display such an adolescent interest in illustrations. They don't realize that you're giving them the best possible illustrations you can get and that if you could get better artists you wouldn't be in the pulp class, I suppose. Again, drawing for pulps is no cinch, what with all the gadgets, etc., and the readers never take that into consideration. Fuqua, Morey Krupa, Paul—there's no outstanding difference, and I'll argue that out to my last day.

Nelson S. Bond, I suppose, is about the best of the crop right now as far as authors go, but I'm wondering if you're not pressing his stuff too much. I sincerely hope he doesn't turn out to be a flash in the pan, because he's too good for that.

Rick Boyd,
342 W. Orange St.
Lancaster, Pa.

A LEWIS FAN

Sirs:

Although at the bottom of your list, "The Fate Changer," by Richard O. Lewis is "tops" with me in the September issue of AMAZING STORIES, your magazine contains some very fine material.

I liked this one particularly because it tells the story so convincingly and without annoying, superfluous detail. It is intensely interesting and has an effective climax. In fact I was completely fooled as I had it all figured out differently, and to my mind, that is the test of a very good story.

Hoping for more stories from the pen of Richard Lewis.

John V. Ryan,
615 5th Ave., So.
Clinton, Ia.

Mr. Lewis has been coming along, and you'll find another of his stories in this issue. It's a story that ought to intrigue you greatly, and we hope you'll find time to make a few comments on it.
—Ed.

LIKES CARL SELWYN

Sirs:

I selected the story "The Strange Death of Richard Sefton" first because it is something different. Here is one story that kept me guessing 'till the very end. It would be very nice if more of its kind were published.

Mrs. Isabelle Schwartz,
133 Van Buren Street,
Brooklyn, N. Y.

Mr. Selwyn will be very glad to know that his story kept you guessing. That was his purpose, and if he achieved it so successfully, you may be sure that he will try to do it again. We think that Mr. Selwyn, (who is only a youngster) will develop into one of the finest science fiction writers in the field. And we want to go down on the record for this prediction!—Ed.

LOST CONTINENT?

Sirs:

Although I personally doubt that "Atlantis" was a lost continent, or even a lost island, in the Atlantic ocean and tend to believe that it was just another name either for a city in the Shott el Jerid (North Africa) or for Tartessos-Tarshish-Scheria near the mouth of the Guadalquivir, I admire the way Bond wove a tapestry of a great number of different and unconnected legends.

Williams' "Rockets Over Europe" was also ingeniously constructed from suspicions, guesses, and reports. But I cannot possibly endorse (not even in a story) a mechanism that turns a rocket around in flight, especially when it has almost reached its target and has, therefore, a very high velocity and certainly no fuel left for a return trip, even if there were no velocity to be killed.

Willy Ley,
35-11 90th Street,
Long Island City, N. Y.

CONGRATULATIONS MR. BOND

Sirs:

Having just finished the concluding installment of "Sons of the Deluge" (one of the few serials that ever appelaed to me), I want to express my opinion that the story combines all the best features of scientific fiction with hardly any of the bad ones.

BOOK ANNUAL DIGEST INDEX - 1974
VOLUME 2 - 1905 - 1974.

in social conscience. 1968
auth. Haven. See 1940
1930
1934
1950
1948
1948
e world, past, 1939
1944
1908
1947
1927-1928
1933
1924
1923
1922
1932
1939
1931
1940
1955
1928
1925-1926
1931
1950
1929
isms 1920
1915
1934
1918
1936
1942
1927
erature 1916
1930
1933
1937
1922
nan. See Goethe, J. 1949
er. See Crocker, B.
loyment? 1925
ry 1945
1926
1937, 1948
Simon)
1960
1948
1947
anger 1962
1961
1952
1944
1955
1954
1957
1951
1925
1956
zi Germany 1964
1974
1956
1919
1906
heart). See Barnes,
1911
1964

Lexington in old Virginia. *See* Boley, H. 1936

Ley, Charles David
Spanish poetry since 1939 1964

Ley, Henry A.
(ed.) Geology of natural gas 1936

Ley, James William Thomas
Dickens circle 1919

Ley, Madeleine
Enchanted eve 1947

Ley, Willy,
Another look at Atlantis 1969
Beyond the solar system 1965
Bombs and bombing 1941
Conquest of space 1949
Dawn of zoology 1968
Days of creation 1942
The discovery of the elements 1968
Dragons in amber 1951
Engineers' dream 1954
Events in space 1969
Exotic zoology 1960
Exploration of Mars 1956
(ed.) Harnessing space 1964
Inside the orbit of the earth 1969
The lungfish and the unicorn 1941
The lungfish, the dodo, and the unicorn 1948
Man-made satellites 1958
Our work in space 1964
The Poles 1963
Rockets 1944
Rockets and space travel 1947
Rockets, missiles, and men in space 1968
Rockets, missiles, and space travel 1951, 1958
Salamanders and other wonders 1955
Shells and shooting 1942
Space pilots 1958
Space stations 1958
Space travel 1959
Visitors from afar: the comets 1970
Watchers of the skies 1963-1964
—jt. auth. Lands beyond. *See* De Camp, L. S. 1952

Ley-Piscator, Maria (same as Marie von Czada Ley-Piscator)
Lot's wife 1954
The Piscator experiment 1968

Leyburn, Ellen Douglass
Strange alloy 1969

Leyburn, James G.
Frontier folkways 1935
Haitian people 1941-1942
The Scotch-Irish 1963

Leyda, Jay
Dianying 1973
Films beget films 1965
Kino: a history of the Russian and Soviet film 1961
Melville log 1951
(ed. and tr.) Musorgsky reader 1947
The years and hours of Emily Dickinson 1961
—jt. auth. Sergei Rachmaninoff. *See* Bertensson, S. 1956

Leydet, François
Time and the river flowing: Grand Canyon 1965
—jt. auth. The last redwoods. *See* Hyde, P. 1964

Leyds, Willem Johannes
First annexation of the Transvaal 1907
Transvaal surrounded 1920

Leyel, Hilda (Wauton)
Herbal delights 1938
Magic of herbs 1927

Leyford, Henry, pseud.
Murder moon 1933

Leyhausen, Paul, jt. auth. Motivation of human and animal behavior. *See* Lorenz, K. 1974

Leyland, John
Achievement of the British navy in the world-war 1918
Royal navy 1914

Leymarie, Jean
Braque 1962

L
–
L
L
L
–
L
L
L
L
L
L
L
L
L
L
L
L

MAGAZINE: THE SATURDAY REVIEW OF LITERATURE
DATE: 16 JANUARY 1954

Sat Review of Literature
16 Jan 1954

Which way?

Maybe you feel that way these days about your own investments.

You can't seem to make up your mind which way to go—whether to buy, sell, or hold certain securities.

We don't know all the answers, of course. No broker does.

But for many years now, we've been plotting the progress of most major industries . . . keeping track of the more important companies . . . erecting the best road signs we can for the benefit of investors.

If you've been wondering just what course you should follow yourself . . .

If you'd like to know just what we think of any given stock—or your complete portfolio—just ask. And the more you tell us about yourself—your financial situation and your investment objectives—the more helpful you'll find our answer.

Customer or not, there's no charge for such an analysis, no obligation. Just address—

WALTER A. SCHOLZ
Department ID-63

MERRILL LYNCH,
PIERCE, FENNER & BEANE
70 Pine Street, New York 5, N. Y.
Offices in 105 Cities

Invest—for the better things in life

The Saturday Review

JANUARY 16, 1954

Cover Photograph (Self Portrait) by Cecil Beaton

SR/IDEAS

8 ARE POETS RETURNING TO LYRICISM? by Melville Cane
10 LEONARD BACON AND MARJORIE KINNAN RAWLINGS: An Appreciation
22 WHERE VIOLENCE BEGINS: An Editorial

SR/BOOKS

11 THE GLASS OF FASHION, by Cecil Beaton
An Essay-Review by Lloyd Morris
14 THE PONDER HEART, by Eudora Welty
Reviewed by William Peden
15 THE DEATH OF KINGS, by Charles Wertenbaker
Reviewed by Charles Lee
15 TOMORROW, by Philip Wylie
Reviewed by Al Hine
16 THE WRONG WAY HOME, by Alex T. Renck
Reviewed by Frederic Morton
17 HUNGERFIELD AND OTHER POEMS, by Robinson Jeffers
Reviewed by Louis Untermeyer
18 THE YEAR ONE, AND OTHER POEMS, by Kathleen Raine
THE WAKING, by Theodore Roethke
Reviewed by Gerard Previn Meyer
26 WILDERNESS OF THE STARS
An Essay-Review by Cornelius Ryan
28 THE CONQUEST OF THE MOON, by Wernher von Braun, Fred L. Whipple, and Willy Ley
Reviewed by Heinz Haber

SR/DEPARTMENTS

6 TRADE WINDS, by Bennett Cerf
12 LITERARY I.Q.
18 LITERARY CRYPT
25 LETTERS TO THE EDITOR
30 BROADWAY POSTSCRIPT, by Henry Hewes
32 *SR* GOES TO THE MOVIES, by Hollis Alpert
34 TV AND RADIO, by Robert Lewis Shayon
35 MUSIC TO MY EARS, by Irving Kolodin
36 BOOKED FOR TRAVEL, by Horace Sutton
43 KINGSLEY DOUBLE-CROSTIC No. 1034

[illegible]

SR's Library Poll

A VOLUME of historical romance and an experienced journalist's appraisal of the present-day European scene are the two titles appearing for the first time this week on *SR*'s survey of popular reading taste as reported by public libraries across the country. Frank Yerby's "The Devil's Laughter" is the item for escapists and Theodore H. White's "Fire in the Ashes" is the book concerned with contemporary affairs of international importance.

TITLE AND AUTHOR

1. **Lélia**
   by André Maurois (G)*
2. **Lord Vanity**
   by Samuel Shellabarger (F)**
3. **The Power of Positive Thinking**
   by Norman Vincent Peale (G)
4. **Too Late the Phalarope**
   by Alan Paton (F)
5. **The Adventures of Augie March**
   by Saul Bellow (F)
6. **From Here to Eternity**
   by James Jones (F)
7. **Beyond This Place**
   by A. J. Cronin (F)
8. **Time and Time Again**
   by James Hilton (F)
9. **Battle Cry**
   by Leon Uris (F)
10. **A House Is Not a Home**
   by Polly Adler (G)
11. **Gone With the Windsors**
   by Iles Brody (G)
12. **Désirée**
   by Annemarie Selinko (F)
13. **Life Is Worth Living**
   by Fulton J. Sheen (G)
14. **The Caine Mutiny**
   by Herman Wouk (F)
15. **Sexual Behavior in the Human Female**
   by Alfred C. Kinsey *et al.* (G)
16. **Flying Saucers from Outer Space**
   by D. E. Keyhoe (G)
17. **The Devil's Laughter**
   by Frank Yerby (F)
18. **A Man Called Peter**
   by Catherine Marshall (G)
19. **Call Me Lucky**
   by Bing Crosby (G)
20. **Fire in the Ashes**
   by Theodore H. White (G)

PARTICIPATING PUBLIC LIBRARIES

Atlanta (Ga.), Birmingham (Ala.), Boston (Mass.), Buffalo (N. Y.), Chicago (Ill.), Cleveland (Ohio), Des Moines (Ia.), Los Angeles (Calif.), Milwaukee (Wis.), Minneapolis (Minn.), New York (N. Y.), Omaha (Neb.), Philadelphia (Pa.), Pittsburgh (Pa.), Richmond (Va.), St. Louis (Mo.), Salt Lake City (Utah), Washington (D. C.).

---

* (G)—General
** (F)—Fiction

How come $1.00 steak from 25¢ steers?

1000 lbs. Steer
at 25.8¢ per lb.
Packer pays
$258.00

Production costs of cattle raisers and feeders include breeding stock, death losses, feed and labor, land use, taxes, interest, supplies, equipment and other expenses for the three full years it takes to produce and feed a choice grade steer.

590 lbs. Beef
at 41¢ per lb.
Retailer pays $241.90

Value of by-products, such as hides, fats, hair, animal feeds, etc., helps offset packers' dressing, handling and selling expenses, so that usually the beef from a steer actually is sold to the retailer for less than the live animal costs. As shown above, packer pays $258.00 for typical 1000-lb. steer—sells meat for $241.90*.

	lbs.	Retail Price	Total
Porterhouse, T-bone & Club Steak	35	$1.00	$35.00
Sirloin Steak	55	.88	48.40
Round Steak	50	.77	38.50
Rib Roast	30	.65	19.50
Boneless Rump Roast	25	.89	22.25
Chuck Roast	105	.55	57.75
Hamburger	100	.42	42.00
Stew Meat & Misc. cuts	50	.56	28.00

450 lbs. of Retail Cuts
Consumer pays $291.40

Retail markup takes into account such costs—and they've been rising—as rent, labor, depreciation on equipment and fixtures, etc. Also there is a loss of weight averaging 140 lbs. from shrinkage, fat and bones not salable to consumers. Prices are typical**.

All cuts of beef are equally nourishing.

If there were equal amounts of all, with an equal demand for all, steak and hamburger and stew meat would all sell at the same price.

But that just isn't the case—see table at right, above.

In general, demand is concentrated on steaks and roasts. This is why porterhouse steak, for example, may sell in some stores for $1.00 while hamburger sells for 42¢.

If consumers don't want steak badly enough to pay $1.00 for it, the price goes down. If they demand more hamburger and the supply does not increase in line with increased demand, the price goes up.

That's how the law of supply and demand works.

*Based on actual government figures—Chicago market reports of U.S. Dept. of Agriculture for choice-grade steers and choice-grade beef, mid-October, 1953.

**Retail prices shown above are averages for all kinds of Chicago stores, including cash-and-carry, charge-and-deliver, in high rent areas and in low rent areas. Prices in some stores may be higher . . . in others lower.

AMERICAN MEAT INSTITUTE Headquarters, Chicago • Members throughout the U. S.

faddist he, then goes on in a rather supercilious manner to paint the scientist as some sort of ogre who is bent on denuding the U. S. of its scientific brains by marshaling all available experts and resources to push his, Von Braun's, space proposals. He names only one scientist, Dr. Milton Rosen of the Naval Research Laboratory, to substantiate his charge; elsewhere it is the "men who work with rockets or guided missiles" who get "cold chills" at Von Braun's proposals. Or it's the "practical guided missile men" who "scream for salvation" from them. It's a pity that Mr. Leonard does not back his statements by naming authorities, for he is not a scientist and is therefore open to criticism.

THE book also lacks fresh research. It is based to a great extent on two or three books which were published within the last few years in which the Von Braun proposals appeared. In spite of this, the author apparently failed to read these works carefully for there are many technical errors. At one point in explaining how a Von Braun rocketship returns to earth from a space station he has the winged vehicle barrel-rolling into the atmosphere. Apparently Mr. Leonard completely misunderstood the method governing the return of this vehicle—he has it, and its unfortunate pilot, entering the atmosphere upside down.

Elsewhere in describing a three-stage rocketship's flight from earth in the manner proposed by Von Braun he writes: "It starts up vertically, but it is turned toward the east by automatic controls while it is still in the atmosphere where its rudders can grip the air." The three-stage rocketship as suggested by Von Braun has no rudders. It turns left or right, goes up or down by the use of swiveling rocket motors because it operates at altitudes where there is too little air to be effective with ordinary airplane-type rudder controls. There are many other inaccuracies, many of them by overstatement or omission.

The book's main argument about the Von Braun proposals are that he is advocating a "crash program" to put man into space. Obviously Mr. Leonard spent little time reading the many papers Von Braun has written over the last ten years. In them he would have found that "beneath the scientist's ambitious proposals lies a very cautious, careful plan of development. But there is still a great need for a really critical and constructive appraisal of the Von Braun theories; Mr. Leonard's book does not fill the bill. Indeed, for a book on space travel it never really gets off the ground.

—From "Conquest of the Moon."

A moonship on a survey of the lunar surface.

Our Kid Sister

"The Conquest of the Moon," by Wernher von Braun, Fred L. Whipple, and Willy Ley; edited by Cornelius Ryan (Viking Press. 126 pp. $4.50), considers the problem, in text and pictures, of a trip to the moon for the purposes of exploration. Below it is reviewed by Heinz Haber, associated physicist at the University of California at Los Angeles and author of "Man in Space."

By Heinz Haber

DURING the past three years a number of highly publicized books and magazine articles have driven home to the public the fact that the feat of the Wright brothers cannot be repeated on an interplanetary scale. The Wright brothers built the first motor-driven airplane in a bicycle shop. The design, construction, and operation of the first spaceship, however, will require a whole industry that will constitute a sizable factor in the economy of a large nation. Space flight will be a gigantic enterprise. How big this job is going to be is related in "Conquest of the Moon," the work of three experts in the fields of rocket propulsion, astronomy, and space flight: Dr. Wernher von Braun, Dr. Fred L. Whipple, and Willy Ley. The book is an outgrowth of a series of articles which first appeared in *Collier's* magazine. Cornelius Ryan, associate editor of *Collier's*, acted as editor of the book.

The objective of the project described is the exploration of a limited section of the moon's surface. The personnel of the expedition consists of fifty highly specialized and selected scientists and engineers who make the trip to the moon, land there, spend a total of six weeks on the desolate, airless face of the moon, and return to the home planet. The project requires: (1) a space station and (2) three moonships. The space station, or artificial satellite, is a huge wheel-shaped structure measuring 250 feet across. It is a man-made moon that swings around the earth in a circular orbit about 1,000 miles above the ground. The three moonships are assembled in the immediate proximity of this "shipyard in the skies"; the parts of the moonships are ferried up into the satellite orbit, unloaded, and pieced together in the void by space-suited assembly workers. The fuel for the ships is then delivered in the same way and finally, when the moonships are fully equipped and tanked, they travel around the earth at a constant speed of 15,840 miles per hour. This speed proves to be an extremely valuable asset for the intended trip, since the moonships require only an additional speed of 3,660 miles per hour launching them into their trajectory to the moon.

THE moonships are huge, weird-looking structures measuring 160 by 110 feet. Fuel and passengers are stored in huge nylon spheres attached to a sturdy duralumin framework which also carries the rocket powerplants and fuel pumps. No streamlined hulls are required for the ships, since they operate in the vacuum of space only. Fully tanked, manned, and equipped they weigh 4,370 tons each, almost 99 per cent of which is fuel load. To haul this monstrous mass into the satellite orbit is a task of fantastic proportions. It requires 360 single flights of three-stage supply rocket ships, at a total expense of over two million tons of fuel. Finally, when two of the three moonships return from the moon—the third is left behind—they will constitute a combined weight of seventy-eight tons.

Five days after blast-off from the satellite orbit the three moonships begin their delicate, automatically controlled landing maneuver on the moon. Resting firmly on the pillar of fire expelled from the exhaust nozzles, they float down gently to an eggshell landing. Then the members of the expedition set up camp. One of the moonships is dismantled, and the ingeniously designed parts are used for quarters. Operating from this base the expedition sets out for an extensive program of lunar explorations with the aim of shedding some light on the exterior and interior constitution of the moon, the origin of the bizarre features on its surface, and many other unsolved riddles that surround the nature and origin of the earth's companion. The most ambitious part of the expedition is a ten-day, 500-mile round trip to a larger crater made with the use of two tractors that house the ten members of the crew in airtight compartments. After two hot moon-days and one chilly moon-night—each two weeks long—the expedition returns to the satellite orbit.

The description of this imposing project abounds in engineering, astronomical, and navigational details. The authors have worked out many ingenious devices and a multitude of delicate machinery that form an efficient, functional design of the whole operation. The details are based on our present engineering and astronomical knowledge. In principle all designs should work. But there is hardly room for technical failure. The job is so big that we are forced to operate in the fringe area of engineering reliability and efficiency. Each piece of equipment and each operation must function as no other product of man ever has.

The authors, the editor, and the illustrators of this book must be commended for having rendered a unique service to the idea of space travel. All too willingly the space enthusiast permits himself to be carried away by the inspiring idea of man's imminent conquest of space. In many circles the conquest of the moon is considered only a first, small step leading to more ambitious feats. In "Conquest of the Moon" the authors have presented ample proof that space flight is a task of fantastic proportions. Billions of dollars, and millions of man-hours by highly skilled personnel will have to be sunk into the moon project. This is the price we will have to pay, if we intend to fulfill man's age-old desire to set foot on an alien celestial body. It is the price we will have to pay for solving yet unsolved riddles of the moon. Let us hope that the political and economic future of mankind will eventually permit us to afford such singular cultural progress.

Brothers in Space

INTERPLANETARY EXPLORATION: It is difficult to realize how rapidly popular notions about space travel have changed. A generation or two ago the subject was the serious concern of a few scientists and science-fiction writers only, and the situation was much the same at the start of World War II. But military research had two important effects. In the first place, it brought about great progress in rocket technology and theory. Also, it produced such spectacular results—atomic energy, radar, electronic "brains"—that skepticism about all future advances will have to be tempered with a measure of confidence in the technical powers of science. The new attitude toward interplanetary exploration is well illustrated in "Our Neighbor Worlds," by the British astronomer V. A. Firsoff (Philosophical Library, $6).

He might be making plans for a drive as he discusses the visit and the possibility of digging mines to exploit lunar ores. "Reaching Mercury, though difficult, is less formidable than is sometimes made out"; "a voyage to Venus is one of the simplest astronautical propositions." It is conceded that trips to Saturn, Jupiter, and other more distant planets would take years and will not be attempted for a long time to come. Rocket experts may disagree with some of Dr. Firsoff's most optimistic statements. But the facts he presents are taken from authoritative sources, and there is no arguing with his general conclusion: "Astronomy, or at any rate that part of it which deals with the solar system, will be placed on substantially the same footing as geography."

—JOHN PFEIFFER

Mint

By George Abbe

AT NIGHT when cool, when cool the good rain comes
and seeks to fall more swiftly, and falls, and returns
to gray heaven, and heat hangs like a bruised plum
on the bough of windlessness, and the crickets' chirr
is muted; now, strange like an amiable scarecrow puzzled
by an old charm, the boy on a bicyle passes,
his shirt sweat-drenched, eyes odd, hair frizzled
with swimming and heat; aimless; his bike pedal flicking grasses
that grow tall, leaning, by the crooked wooden fence. . .

Then, faint, but longed-for and pleasant as arms of a lover,
the spice of meadow mint enfolds the heart,
frail and ghostly, but true as wild bird's hover,
and the boy, not knowing why, feels the throat's gate
break wide with joy, and rising on pedals flings
his weight at distance, and speeds on evening's wings.

Wilderness of the Stars

Since World War II there has been a revolution in scientific thinking about the possibility of travel to other planets. In the essay that follows, Cornelius Ryan, associate editor of Collier's magazine and a specialist on space-travel, tells what these new ideas are and appraises three recently published books on the subject.

By Cornelius Ryan

IT IS already an accepted fact, shared not only by laymen but also by many distinguished scientists, that in the not too distant future man will venture beyond the atmosphere to brave the inhospitable reaches of space. Once there and safely ensconced in a wheel-like, air-conditioned space station slowly traveling in an orbit around the globe, he can get down to the real business afoot—the exploration of the heavens.

Certainly the extraordinary achievements in the development of research planes, high-altitude rockets, and the intensive work now underway in the field of space medicine, all seem to be directed toward or at least to imply that space flight is in the offing. However, it would be wrong to assume that tomorrow's manned rocketship will be developed by accident as it were, or as a by-product perhaps of these various research programs.

Dr. Wernher von Braun, perhaps the foremost authority in the world today on rocketry and its application to space travel, has written that "the conquest of space is as inevitable as the rising of the sun . . . but it is a task of too great magnitude to be a mere product of some other work . . . it requires a well-coordinated program extending over a number of years, each step dovetailing into the whole pattern." Today's research is producing only the mortar to hold all the scientific bricks of tomorrow's space program together and that is all.

True, the technical specifications of rocketships, space stations, and the type of vehicles to carry expeditions from earth satellites to the moon or Mars have been blueprinted by Von Braun and others in remarkable detail. Sizes, weights, speeds, fuel requirements, and methods of operation have all been worked out in the most painstaking manner. And from today's upper atmosphere research plus a vast stock of physical, psychological, and astronomical information methods have been devised to protect what Dr. Heinz Haber calls the "weakest link in any effort to reach space—man himself." But all of this knowledge—most of which is theoretical anyway—represents only a mere beginning to the staggeringly difficult and costly project of sending man into space. Regrettably, this fact is rarely emphasized in space-flight literature. The result of this omission and others equally as serious, and the whole aided by Hollywood and TV's extraterrestrial flights of fancy, have given the average reader the impression that any day now—if not already—man will blast off for the star-studded blackness of space.

Of course, nothing could be further from the truth. Manned space flight and the erection of a space station could be a reality within ten years, the moon could be reached within twenty-five to fifty years—*providing that an all-out development program began now.* It is this latter consideration which is conveniently forgotten in so many works on space travel.

Of the scores of books which have appeared on the subject since World War II it can be said that a good 60 per cent have been fanciful, wildly improbable, and technically absurd productions. Some authors have quite casually taken the laws of physics and, whether through ignorance or deliberate intent, have twisted them to suit their own convenience. Others have quite cheerfully sent rocketships soaring through space at such incredible speeds that the unfortunate occupants could not possibly have survived. And how often have these pseudo-scientific books included illustrations which were totally misleading!

One example which comes to mind, and which seems to crop up in one form or another in many of these offerings, is the drawing of a tall, slender, bullet-shaped rocketship being "readied for a trip to the moon." The reader is rarely told that for such a vehicle to tear away from the earth's gravitational pull, speed 239,000 miles to the moon, land on that lonesome body and then return to earth, it would have to carry so much fuel that it would weigh perhaps 900,000 tons and stand as tall as the Empire State Building!

Over the last ten years specialists such as Von Braun, Zwicky of California Institute of Technology, Truax of the U. S. Navy, and others have repeatedly pointed out that man's first real efforts to reach out of his atmosphere will be to establish a robot laboratory in an orbit close to the earth. This will be the first step—a far cry from the huge rocketships of pseudo-scientific space travel literature. Unmanned, but loaded with measuring instruments all hooked up to automatically reporting radio equipment, this "baby space station" will verify and confirm much of the theoretical knowledge now available. Only years later, after much trial and error, will man gingerly venture into space in a rocketship. But the vast majority of books on space travel have so misled their readers regarding this sequence of events that one cannot help but wonder if the first tentative steps may not indeed prove anticlimactic!

THANKFULLY, however, a small number of authoritative books have appeared during the last few years which have to some extent balanced the spate of pseudo-scientific offerings. Besides such first-rate science writers as Britain's A. C. Clark ("The Exploration of Space") and Willy Ley ("Rockets, Missiles, and Space Travel," etc.) among others, a number of scientists have written books on space travel or on allied subjects which are a "must" for those who are seriously interested in the astronomical, physiological, or engineering aspects of the problems involved. Chief among these authorities are: Dr. Wernher von Braun, the Army's guided missiles expert; Sir Harold Spenser Jones, Britain Astronomer Royal; Dr. Fred L. Whipple and Dr. Donald C. Menzel, both of Harvard; Dr. Heinz Haber of UCLA, and Dr. Hubertus Strughold of the Air Force's School of Aviation Medicine.

Two new books from this coterie recently appeared: Dr. Wernher von Braun's **"The Mars Project"** (University of Illinois Press, $3.95) and Dr. Hubertus Strughold's **"The Green and Red Planet"** (University of New Mexico Press, $4)—the former deals with the engineering requirements and mechanical problems relating to a journey to Mars, the latter is a physiological study of the possibility of life on that planet. A third book called **"Flight Into Space"** (Random House, $3.50) by Jonathan Norton Leonard, while by no means in the same class as the other two, has recently been published and deserves mention.

Von Braun makes the point very clear from the onset that his Mars proposal is nothing more than a rough outline dealing with some of the problems which an interplanetary trip would entail. But for a "rough outline" it is a very complete work—at least from a mechanical standpoint. It includes detailed mathematical data, astronomical and physical tables, tabulations of weights, speeds, fuel requirements, and logistical considerations. While the book is highly technical because of this, it nevertheless offers to scientists and engineers a point-by-point breakdown of the basic problems involved.

Briefly, Von Braun assumes that an expedition to Mars would have to be on the "grand scale" and that a considerable amount of work would have been accomplished years before any attempt to reach Mars was even considered. In previous works Von Braun has advocated the establishment of a space station 1,075 miles above the earth in a so-called "two hour" orbit—meaning that the station would travel in a north-to-south direction around the globe once every two hours. His Mars plan calls for the erection of another space station—this one traveling in the plane of the equator, in a west-to-east direction.

THE Mars station would be fed with supplies by ferrying rocketships plying between it and Earth. A fleet of ten Mars vehicles would be assembled in space at the Mars station from parts ferried up by the rocketships and the entire flotilla would be capable of carrying an expedition of seventy men. The costs would be staggering—propellants during the ferrying operations alone amounting to half a billion dollars, yet the "propellants for the actual interplanetary voyage [would be] trifling in comparison, being no more than three and a half million dollars." The total duration of the expedition would be two years and 239 days, of which time one year and 155 days would be spent in traveling to and from Mars. The actual duration of stay on the planet would be a little over thirteen months.

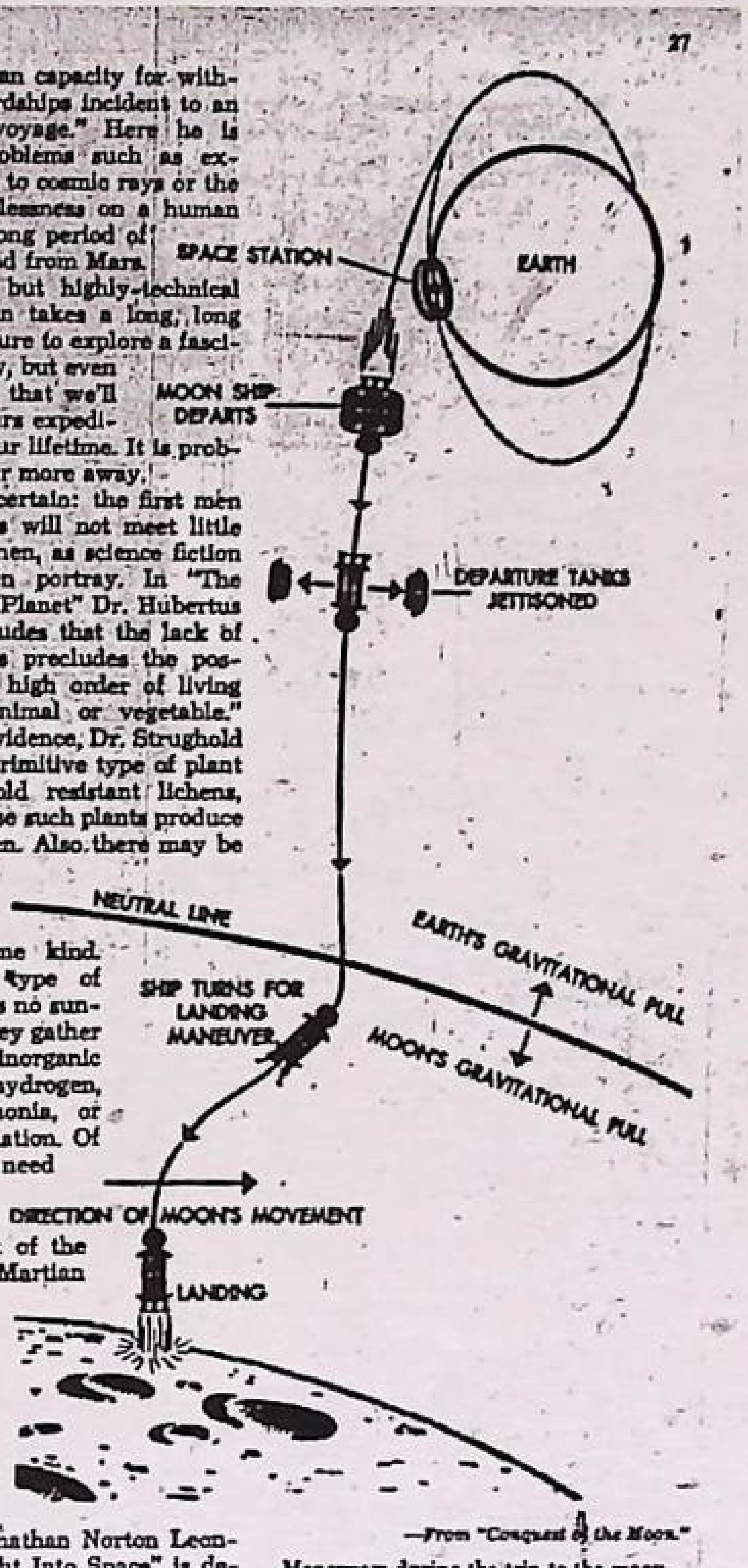
Von Braun sticks throughout the book to the mechanical aspects only. He does not attempt to answer such problems as astronavigation or the possible hazards of meteoric concentrations between Earth and Mars. Neither does he discuss what he calls the "problem-complex revolving around the human capacity for withstanding the hardships incident to an interplanetary voyage." Here he is referring to problems such as extended exposure to cosmic rays or the effect of weightlessness on a human body over the long period of the voyage to and from Mars.

In this slim, but highly-technical book Von Braun takes a long, long look into the future to explore a fascinating possibility, but even he would agree that we'll hardly see a Mars expedition set out in our lifetime. It is probably a century or more away.

One thing is certain: the first men to land on Mars will not meet little green-skinned men, as science fiction writers so often portray. In "The Green and Red Planet" Dr. Hubertus Strughold concludes that the lack of oxygen on Mars precludes the possibility of "any high order of living things either animal or vegetable." There is some evidence, Dr. Strughold believes, for a primitive type of plant life such as cold resistant lichens, primarily because such plants produce their own oxygen. Also there may be a lowly type of animal existence such as bacteria of some kind. This primitive type of animal life needs no sunshine. Instead they gather energy from inorganic matter such as hydrogen, menthane, ammonia, or the like by oxidation. Of course, they also need oxygen, but in this respect the low content of the oxygen in the Martian atmosphere may be sufficient.

While these two books have limited appeal because of their technical nature, Jonathan Norton Leonard's book "Flight Into Space" is designed for a more general audience. For a long time there has been a great need for a well-grounded critical work on all the aspects of space flight—if for no other reasons than to bring all of the problems into perspective. Mr. Leonard's book starts out being that book.

The first third of the work gives every promise of being a definitive report on rocketry now and in the future, but from there on it loses strength because the author becomes obsessed with his dislike of Dr. Von Braun's theories. In fact, the book amounts to a neat attack on Von Braun.


SPACE STATION
EARTH
MOON SHIP DEPARTS
DEPARTURE TANKS JETTISONED
NEUTRAL LINE
EARTH'S GRAVITATIONAL PULL
MOON'S GRAVITATIONAL PULL
SHIP TURNS FOR LANDING MANEUVER
DIRECTION OF MOON'S MOVEMENT
LANDING

—*From "Conquest of the Moon."*

Maneuvers during the trip to the moon.

Glibly and slickly he snipes and belittles Von Braun's theories. "Von Braun," he writes, "appears to be a practical man if not looked at too closely. He speaks incisively with the faintest German accent, and he can and has impressed both German and American military experts. He can also inspire an audience of civilian engineers, or of kids or of theoretical scientists or of mush-minded faddists."

Mr. Leonard, no mush-minded

Oct 1946 Science Digest Vol 20 #4

globe and voice suspicions. Sumatra, for example, is known to harbor a "new" variety of rhinoceros, in addition to the well known type. Specimens have even been shot, but never under circumstances which permitted a complete scientific investigation.

New Guinea is said to be the home of a large marsupial, and Burma is believed to harbor a variety of deer, black in color and reported to have a strange call curiously resembling the barking of a dog. Even Europe may still boast an undiscovered animal in the Swiss and Austrian Alps, described as a large and very rare lizard.

But the "promised land" for still undiscovered animals is Africa. More precisely, it is the equatorial belt of Africa, stretching roughly 2,000 miles across the continent and extending for about 1,000 miles on either side of the equator. It is the Rainy Forest in that equatorial belt on which suspicion has been focussing for the last 40 years.

It is this territory which still harbors a number of "mystery animals," dimly known to science through incomplete—and not invariably trustworthy—reports. It is this section which has produced four major zoological discoveries within three decades.

The first was the okapi, a short-necked relative of the giraffe. First rumors of its existence reached the civilized world in about 1890 when Sir Henry Stanley, reporting on one of the pygmy tribes of the Congo region, stated that they had a word "atti" which meant "donkey" that such "attis" were occasion caught in pits.

To experts this statement w rather mysterious. No donkey w known from that section. It m be one of the zebras, but zeb avoid forests and those pygm lived where the forest was dens and most inhospitable.

Sir Harry Johnston decided th it was either a variety of zeb which did not mind forest envir ment, or else an unknown anim more or less resembling a donk

He set out to investigate . . . a now the books state that "Sir Harr Johnston discovered the okapi the Congo forest in 1900."

At first it was believed to be new variety of zebra, but when tw complete skins and a skull reache London, the novel fact of a sur viving short-necked giraffe was e tablished and the Negro name oka was officially adopted.

The range of the okapi is in th northeastern corner of the Rain Forest. This region is called th Ituri Forest—and the Ituri Fores the natives said, harbored an eno mous wild hog, black in color and as big as a small rhinoceros.

The ferocious forest hog of th natives remained a riddle for a fu quarter of a century. Then it foun its solution, and the solution wa simple: the animal existed. Capt R. Meinertzhagen of the Britis East African Rifles discovered it in 1904, securing an imperfect skin that had come from the forest of Mount Kenya. He also obtained ll from the forest bordering oria Lake.

he animal is now known scien- lly as "Hylochoerus." While ctually as large as a small ceros it is by far the largest of ild pigs of Africa and its fur is lly jet-black.

Like the okapi it represents a m otherwise extinct and belong- to former periods of earth's tory.

The discovery that there was a erian variety, seemed to solve ther old zoological puzzle. In 88 a Dutchman, Dr. Dapper, ote a ponderous description of Liberian coast, and mentioned ee varieties of wild hogs occur- g there. Two were quite ordinary, the third was unknown.

Somebody guessed that Dr. Dap- s mysterious black hog was the me animal which had been de- ribed in 1844 by a U. S. physician, r. Samuel G. Morton. All that r. Morton had to go by was the tement that the animal looked e a large pig, but he had a com- te skull of that animal.

From the skull Dr. Morton es- lished that the "big pig" was tually a relative of the hippo- tamus, but of smaller size, "only" out six feet long. He called it hoeropsis"; popular books re- rred to it as "pygmy hippo," it as believed that the animal was tinct.

But rumors about "large pigs" pt coming from Liberia. Some bviously referred to Hylochoerus, hers sounded much more like Choeropsis. But Choeropsis was extinct!

About 1909 the rumors became too plentiful and Carl Hagenbeck in Germany finally sent his best man, Hans Schomburgk, to Liberia in order to find the real reason for all this talk.

Something was to be discovered there, either the "extinct" Choeropi or else something entirely new.

Every educated Liberian, colored or white, was fully convinced that Choeropsis was extinct. And the natives of the interior believed Schomburgk crazy, not because he was looking for this animal which they knew well, but because he wanted it alive. One could, with luck and sharp weapons, kill a "nigbve" (as they called it) but one could not catch it alive.

But one year later Schomburgk brought live pygmy hippos back with him.

While Schomburgk was going after Choeropsis, an expedition of the New York Zoological society, consisting mainly of Herbert Lang and Dr. James P. Chapin, was trying to get a live okapi for the Bronx Park zoo.

Though they were unsuccessful, all unknowingly they discovered a new bird. They brought native headdresses back with them and examination at home showed that one of the headdresses contained feathers of unknown origin.

For more than 20 years, Dr Chapin was haunted by the mystery of these unidentifiable feathers.

A chance discovery in a Belgian

museum in 1936, consisting of an examination of two wrongly labelled stuffed birds, furnished a clue. These unidentifiable feathers had come from an African peacock (later called "Afropavo congensis"), a so far completely unknown bird. All that remained to be done was to verify its actual habitat.

Dr. Chapin did this by flying to Stanleyville. Afropavo turned out to be well known to native hunters. It has a fairly restricted habitat, but is not excessively rare where it occurs. The habitat is, one is tempted to write "of course," the eastern edge of the Rainy Forest from the Ituri Forest down to the Sankuru river.

Even if there were no rumors left it would be an obvious question to ask whether the Rainy Forest might not harbor more unknown creatures. The rumors say that it does, and a good number of them look fairly substantial. Hans Schomburgk gathered quite a number of them when he was looking for Choeropsis and told me about them one night in Berlin, about a dozen years ago.

While asking questions about "large pigs," with the purpose of locating the haunts of the pygmy hippo, he fell in again and again with reports of a small mountain rhinoceros.

Now Schomburgk knew about Meinertzhagen's forest hog and that it had been termed "a small rhinoceros."

He also knew that a native, trying to be polite, will unhesitatingly affirm that there is, in Sch burgk's words, "a large animal w seven horns but only one eye blue fur" if the interrogator sh inclinations to be told about s an animal.

So Schomburgk said, oh yes, a proceeded to describe the for hog. To his great surprise the tive hunters contradicted vig ously and told him in what resp the "mountain rhinoceros" diffe from the black pig.

It was evident that the nat hunters knew what they were ta ing about. Schomburgk came to t conclusion that the mountains eastern Liberia actually harbor small-size form of the rhinocer But so far the small "mount rhino" has not been discovered.

Other rumors of the Rainy F est deal with a cat the size of leopard but of different habits; animal called "too" which is d scribed as goat-sized and black; a the so-called nandi bear, a be like animal which is said to be forest dweller and a night prowl

Various settlers have report that this animal was occasional killed by poisoned meat put out f hyenas, even photographs are sa to have been taken, but so far th "nandi bear" has never been track down by a naturalist.

But the prize story of all the st ies of unknown animals of equator Africa is that of the "dragon of th Congo Forest," the animal "m kele-mbembe" of the natives.

Though it seems much more fa tastic at first glance than any of th

other reports, it is actually one of the best documented. These other undiscovered animals are, after all, strange only because they are not yet known to science.

But the animal "mokele-mbembe" is described as a living dinosaur!

It is probably not a dinosaur in the zoological sense, but it is, in all probability, a large reptile. Schomburgk carried one of the tales about such an animal.

When he came to Lake Bangweolo, outside the limits of the Rainy Forest proper, he was surprised that hippopotami were lacking, although the lake was just such a body of water which would harbor hippopotami.

The natives had an explanation. The lake did not have hippopotami because it was inhabited by an animal which, although somewhat smaller in size, killed them.

There was also an old, old picture which could be taken to contribute evidence. That picture came from the Ishtar Gate of Babylon, erected, according to archaeological findings, by King Nebuchadnezzar.

To express the splendor of the great king, colored bas-reliefs of animals were imbedded into the walls, a long row of majestically walking lions along the procession way, and alternating rows of "rimi and sirrushu" on the gate itself. The "rimi" are wild oxen. The "sirrushu" are the "dragons" of Babylon.

The question now arises whether the sirrush is a mythical monster or whether the Babylonians pictured an animal with which they were familiar and we are not. Offhand it would seem strange that they should place a mythical monster between two existing animals —the lions and "rimi."

I think that, purely from the point of view of logic, the chances are even that the sirrush is the picture of an actually existing animal too. This assumption does not imply that this animal was frequent or even that it occurred near Babylon. On the contrary, it may have been given its place of honor just because it was a "strange beast from far lands."

In build the sirrush is strongly reminiscent of certain extinct dinosaurs, with a long neck, with forefeet resembling the paws of a mammal and hind feet looking like those of a bird.

It has a forked tongue like snakes and monitor lizards and apparently some flaps of skinny membrane at the head, very much like certain chameleons and other types of living reptiles.

It is described as having a long and muscular tail like an alligator. In size it is said to be intermediate between hippopotamus and elephant.

And there can be little doubt that Central Africa still harbors a large long-necked animal of some kind which shows a definite preference for an aquatic environment and which is, in all probability, a large reptile.

Speaking of BOOKS

About myths and eccentrics—plus some tips on those youngsters now flocking back to school.

By JOHN T. FREDERICK

SCIENCE fiction is nothing new in literature. It isn't merely a matter of going back to such early books of H. G. Wells as *The Food of the Gods* or *The Time Machine*. Nor to those of Jules Verne in which such modern commonplaces as the submarine, radio, and radar were projected as romantic possibilities. Science fiction is far older than that; its beginnings go back, indeed, close to the very beginnings of literary expression.

The essence of science fiction is human adventure in places or times not actually known by human beings; hence the adventure is imaginative, and the experience is not susceptible of checking against ascertained fact. To the writers of ancient times, great portions of the earth's surface were, in effect, as remote as Mars. The human capacity—perhaps it is a need—to be entertained by imaginative adventure .seems to be as old as the race. Hence, we have all through literature the story of imaginative adventure, usually posing as a traveller's tale and partially based on fact or hearsay. That these yarns related adventures purporting to have occurred on our own planet doesn't make them less kin to the stories of space ships and interplanetary war which so many readers enjoy today.

It is appropriate that Willy Ley, a well-known authority on rockets and guided missiles, should have thought of surveying the long history of writing of this kind. He has done so very pleasantly, with L. Sprague de Camp as coauthor, in *Lands Beyond*. An earlier book of Ley's, *The Lungfish, the Dodo, and the Unicorn*, was a delight. The present book is much like it. Here is the record of man's imaginings of the universe, for always, as today, there have been the "lands beyond" and those able and willing to tell about them. To me the most interesting chapter in the book is that on "The Shape of the Earth." At least by the time of Plato, the authors show, men of science knew that the earth was spherical. Yet as recently as within the present century the belief that the earth was flat was stoutly argued by Wilbur Glenn Voliva, of Zion fame, and his adherents; and this is still the view held by some primitive tribes.

A caricature of Wilkie Collins, colorful 19th Century writer.

Kenneth Robinson, author of the new Collins biography.

Other theories described in this book are those of a pyramidal earth, a saucer-shaped earth, and an earth in parallel layers. One of the more ancient (and more astounding) theories is that of the earth as a hollow sphere, with openings at the poles, habitable and inhabited inside as well as outside. This view was stridently and persistently maintained in 1818 and the decades following by one Captain John Cleves Symmes, an American who announced the theory as an original discovery, though it had been propounded long before his time. Ley and de Camp write very entertainingly of Symmes and the rather respectful attention he received, but do not note the fact that one of the masterpieces of American imaginative literature, *The Narrative of Arthur Gordon Pym*, by Edgar Allan Poe (his only work of fiction of book length), seemingly is based on an adaptation of Symmes' theory.

The Ley-de Camp style is piquant. I quote almost at random:

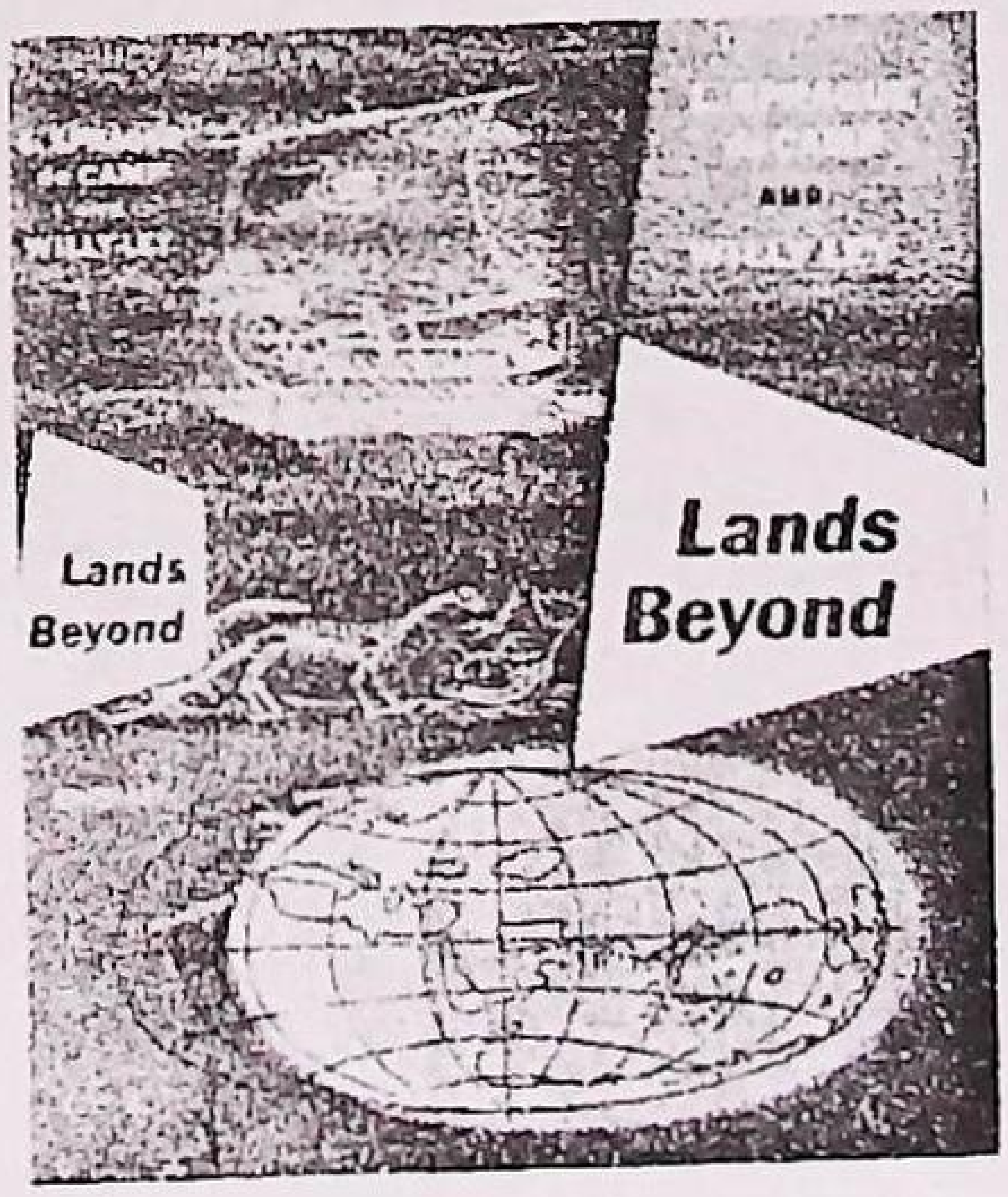
> The Magnetic Mountain also plays a part in the European Virgil-legend cycle. . . . These medieval legends transformed the gentle poet of Mantua into a mighty wizard who built Naples on a foundation of eggs and who kidnapped the daughter of the Sultan of Egypt by riding across the Mediterranean on a bridge of "immobile air" which he created by means of his spells. He also made a brazen talismanic fly which kept all flies out of Naples, a bronze archer which kept Vesuvius in check by threatening it with a drawn bow, medicinal baths to cure all diseases, an aqueduct to take wine from Naples to Rome, and many other wonders.

If we stop to think, aren't some of these details a bit suggestive of some of those in the science fiction of today?

Lands Beyond gives impressive evidence of the power of the human imagination—and of the extent of human credulity. It may send you hunting for neglected masterpieces in its field—for example, Sir Arthur Conan Doyle's *The Lost World*, and *Nicholas Klim*, by Ludvig Baron von Holberg, an 18th Century narrative little known in English-speaking countries, but popular to this day among Scandinavian readers. *Lands Beyond* is very good reading.

If you are a mystery-story fan, probably you have read those great early examples of the form: *The Woman in White* and *The Moonstone*, by Wilkie Collins. If you haven't, don't postpone the pleasure. You have never read a biography of the eccentric artist who was their author, however, unless very recently, for *Wilkie Collins*, by Kenneth Robinson, is the first real biography of one of the most interesting of 19th Century British men of letters. The author was a British insurance broker, later a lieutenant commander in the Royal Navy, and still later a member of Parliament, who became interested in Collins, recognized the need for a good biography—"I began to wonder what kind of man he was," he says—and has written an admirable one.

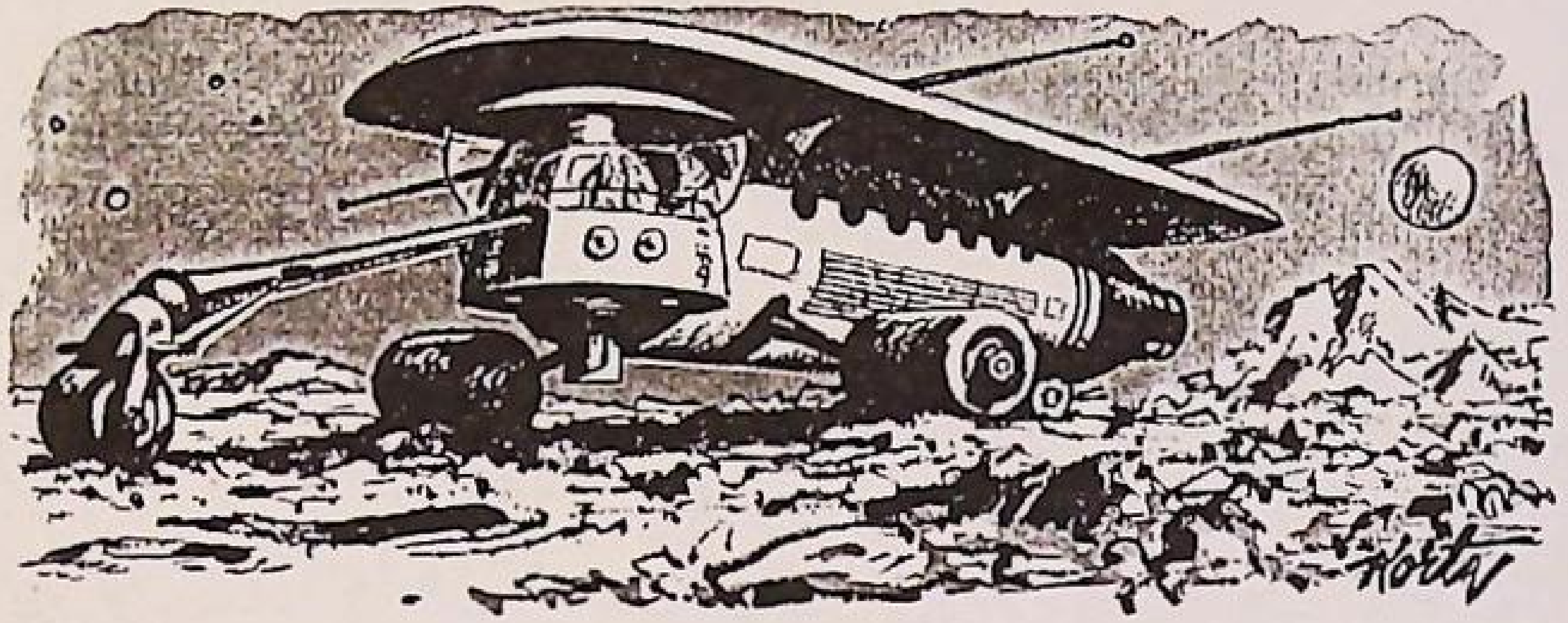
Perhaps the richest vein in this book of many pleasures is that which fol-



Lands and persons that never were—from Atlantis to El Dorado—are the theme of this book by de Camp and Ley.

The Rotarian Vol LXXXI #3

SCIENCE DIGEST
SEPTEMBER 1958
VOLUME 44 #3



Getting around on other planets won't be nearly as hard as getting to them—but it won't be easy, either

Fantastic Cars for Other Planets

by Willy Ley

Condensed from Galaxy Science Fiction

THE YEAR will be around 1985 A.D. Capt. Sixtus E. Boyle, assisted by navigator Roderich Meerschaum, has just put his ship down on Mars.

Before landing, they had orbited Mars for several days in order to take detailed pictures of the surface in the equatorial regions so that they could decide on a suitable spot for landing. Their general instructions had been somewhat vague about the landing itself — merely stating that the landing should be made near the Martian equator for reasons of temperatures.

Near the equator, one could expect reasonable temperatures during the day. The nights would be extremely cold, but far from the equator it would be cold around the clock.

In addition to the order to land near the equator, the instructions merely said that the landing place should be "in the proximity of interesting formations." Capt. Boyle finally found a spot on the photographs which looked like smooth desert with a ridge of fairly high hills (rare on Mars) not too far away. There is also a "canal" nearby.

Now the ship sits on the desert sand, undamaged. The ridge of hills is to the north and looks as if it were about 5 miles away. And the "canal," or whatever it really is, must be to the east. It is not visible from the ship, but if they hit anywhere near the intended spot, it would be about 20 miles away.

The captain decides that one does not explore well on an empty stomach, so the crew eats first. There is a rest period of several hours, then the captain assigns watches and two men break out the ground car.

• • •

Now let's come back from the future and think about that ground car for Mars. How would you design ground transportation for such different conditions?

But the first question might well be whether you really need a ground car. What's wrong with walking?

Of course one could walk on Mars.

> • **Sober reflection quickly indicates . . . that we still are in the model-T age of jets, nuclear power, space missiles, and interplanetary exploration.**
>
> —Walter J. Murphy

As has been mentioned, the daytime temperatures near the Martian equator are bearable, even if highly extreme. In the morning, say, one hour after sunrise, it is still about 90 below zero Fahrenheit. An hour after noon, it is around 70 above zero. The tropics of Mars might better be called its "intemperate zone," but they do not represent an impossible situation. Our own highland of Tibet is very nearly as bad; the temperature does not go as low during the night, but it climbs to around 100° F. in daytime when the season is right.

Air pressure is a somewhat different story. The Martian atmosphere, near the ground, has roughly the same pressure as our own atmosphere 11 miles up. This calls for a pressure suit, especially since the oxygen content seems to be near zero. Even if it were all oxygen, a man could not breathe at such a low pressure.

The inconvenience of the pressure suit is more than compensated by the low gravity— a man will weigh precisely 38 percent of what he weighs on earth. Which means that even a heavy suit, with oxygen bottles on the back and all kinds of hand tools dangling from the belt, will not produce full earth weight for the explorer.

So one could walk, and the men will do it for short distances. But, for exploration, ground transportation of some kind is needed.

The design of any kind of ground transportation is chiefly influenced by the nature of the ground. On Mars, there may be rocky ground in many places. Much of it must be sandy desert. And in those areas which look dark when seen from the earth, there are likely to be salty marshes. For all these types of ground, wheels are not practical.

The first alternative that always occurs to everybody is the caterpillar tread. But it has its limitations too, and for Mars the best bet is the so-called "rolligon" — the barrel-shaped inflated pillows developed for similar conditions on the earth.

Rolligons produce fine traction on sand and do not sink in. They can tolerate very rough rocky ground and don't shake up the driver in the process. They do well in marshes, and if the water should be too deep, they will float. They could be inflated on the spot with Martian atmosphere. It would take some time because the Martian atmosphere is

---

Galaxy Science Fiction (Aug. '58), 421 Hudson St., New York 14, N. Y. Copyright 1958 by Galaxy Publishing Corp.

1958 [illegible] 4#3

so thin, but it can be compressed.

The question of engine power is somewhat more complicated. It must not need air, for we have to go on the assumption that Martian air will not sustain combustion, even when compressed to what we consider normal density. Right now we know three types of non-air-breathing engines. They are (1) the rocket, (2) the electric motor, and (3) the atomic reactor.

Rocket power is useless for the conditions in question, because the ground vehicles must be able to move very slowly, which is the one thing the rocket cannot do, at least not efficiently.

The electric motor could provide almost any speed range desired, but it needs electric current. Of course, one might say that between 1958 and 1985 somebody may invent an incredibly efficient kind of storage battery. This is possible, but nobody can promise that somebody else will.

Maybe an atomic reactor can be built small enough and light enough, in time, but it would be hard to say when, and impossible to tell what other complications might go with a small reactor.

It was pointed out several years ago—by Wernher von Braun—that a ground car for an airless planet or a planet with oxygenless atmosphere could be turbine-powered, provided you pick the right fuel for the turbine. The right fuel would be hydrogen peroxide, H_2O_2.

At ordinary temperatures, hydrogen peroxide is a liquid and it is quite safe if it does not contain any other impurities than water. When hydrogen peroxide is decomposed, the reaction produces water and free oxygen. It also produces a large amount of heat. Hence the water appears in the form of steam, so that the product is a mixture of steam and hot oxygen. This steam can turn a turbine wheel.

After it has passed through the turbine wheel, the steam-oxygen mixture enters a combustion chamber where some ordinary fuel like gasoline is injected. After it has burned, there is now a mixture of hot carbon dioxide from the combustion and reheated steam. This can drive a second turbine wheel.

You have here what is known as a two-stage turbine which is not air-breathing, hence the ideal power-plant for ground vehicles on airless or oxygenless planets.

But by the time an expedition sets out for Mars, there will be an establishment of some sort on the moon. Conditions on the surface of the moon are like those on Mars, with much exaggeration.

Where Mars has a thin atmosphere, the moon has just traces of gases: argon and so forth. Where Mars cools off to an estimated 70 degrees below zero during the night, the moon cools to an estimated 200 degrees below zero during its night; if a night lasts two weeks, earth time, the surface obviously has a better chance to radiate what heat it has into space. Likewise, the two-week day produces higher temperatures as it wears on slowly.

Near the moon's equator, the temperature of the surface rock climbs to beyond the boiling point of water after a week of sunshine.

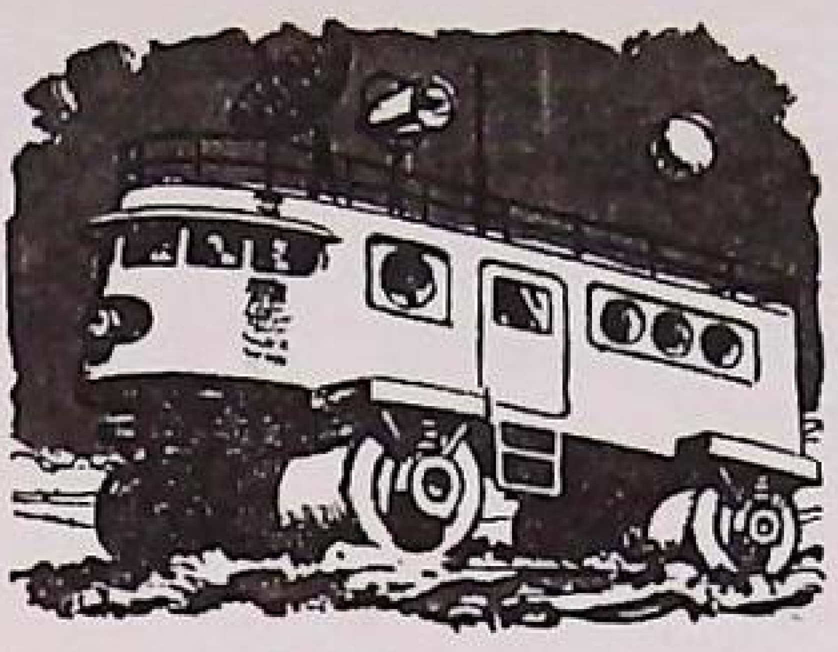
As for the condition of the lunar surface, one can only say that it is not earthlike. The old ideas about the rock cracking into splinters because of the large temperature span between day and night have been abandoned. Laboratory experiments have shown that rock will not crack if heated and cooled as slowly as in the course of a full lunar day.

But the rock is being pounded by meteorites of all sizes. Meteorites of a size that form craters visible from earth are naturally rare. But cosmic dust grains are very frequent. Each dust grain hitting lunar rock will produce several other dust grains.

The cosmic rays also join in this work; they can, and in time will, break up the crystalline structure of the rock.

The overall result of these forces, acting over several million years of time, must be sharp rocks on the one hand and a layer of dust on the other. On an exposed vertical rock surface, the formation of dust must be continuous, since the rock flakes and dust produced will simply fall off and settle on the ground. On a flat area, however, the process must be self-limiting, because the dust formed will protect the rock underneath against further meteorite and cosmic-ray impacts.

The question is when does the dust itself become protection? In the case of tiny meteorites the size of sand grains, half an inch of dust will obviously be enough; the force of a new impact will not be carried through such a layer. Cosmic rays could easily penetrate a half-inch layer of dust, however, and continue destroying the rock. But this process must be self-limiting too, except that the required dust layer would have to be thicker.



ROLLIGON MARS CAR, in an artist's conception. Vehicle, it is predicted by designers, will be driven by a hydrogen peroxide turbine.

The consensus right now is that the average depth of a dust layer might be about an inch, but that in some places a much deeper accumulation is easily possible. If dust is fine enough, it will behave more or less like water, and the English astronomer Thomas Gold—now in the United States — has suggested that the smoothness of the moon's *maria* is due to such a dust accumulation; the *maria* might be just large depressions filled with dust.

The lunar surface, then, must be rocky with a dust layer on top, with possible accumulations of dust of great depth.

The two-stage hydrogen peroxide turbine would work on the moon too; the problem is what shape to give to the car. Most people who have thought about this problem have simply settled for a tank as the most likely shape. Caterpillar treads can negotiate any kind of ground except ground that is very soft. They do not slip easily on gravel and can take considerable inclines.

But so can rolligons, and if there are such dust-filled depressions, the rolligons would be safer. If a tank shape is picked, it might be practical to have a tank push an ordinary heavy wheel ahead of itself on a boom. This would show where the ground is treacherous.

Another likely shape for a moon car would be a vehicle which simply has four very large wheels, at least 15 feet in diameter, with spiked rims. Such a vehicle could make much better speed on flat ground, and because of the large size of the wheels, there would be a high clearance between the body of the car and the ground, which would permit the passing of obstacles where a tank would have to lurch and clamber.

It is very likely that every moon car would have to carry a sheet-metal "shield" on vertical booms above its body.

This shield would, in the first place, be a protection against too much sunlight. Since the moon lacks anything that could reasonably be called an atmosphere, the sunlight beating down on the lunar plains will be about three times as powerful as the tropical sun on a clear day on earth.

In the second place, the shield would protect the body of the car against the fairly frequent dust particles coming from space with an average velocity of 40 miles per second. They would cover the shield with nearly microscopic pits in the course of time, but they would not penetrate.

But if there is a permanent base of some kind on the moon, electricity would be a possible source of power for the moon cars in the vicinity of the base. The base would have an atomic reactor, a stationary powerplant, for its own needs. Ground cars staying close to the base could run on rechargeable batteries.

The problem is that rechargeable batteries must not be exposed to a vacuum; they have to be pressurized —that is, they must be located in the interior of the moon car. This might be inconvenient, to say the least, and the designers therefore are likely to fall back on a trick used in Switzerland a few years ago.

Engineers of the Swiss firm of Oerlikon, at Oerlikon, near Zürich, built an experimental bus with a capacity of two dozen passengers. The wheels of this bus were driven by an ordinary 3-phase electric motor, but the current for the motor was not supplied by either overhead wire or by batteries. The energy was stored in a 1-ton flywheel, measuring 6 feet in diameter and mounted in a horizontal position under the floor of the bus.

To reduce friction, the Swiss engineers ran the flywheel in a sealed casing in a hydrogen atmosphere, but this is a minor point.

A second motor was mounted on the flywheel shaft, and at the terminal, this motor brought the flywheel up to 3,000 revolutions per minute, drawing current from the net. When disconnected from the net, this motor became the generator, drawing mechanical energy from the flywheel and supplying electric current to the drive motor.

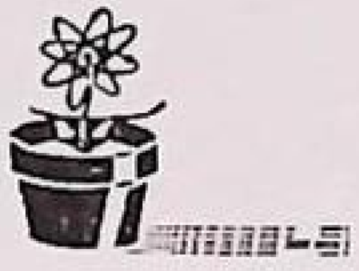
After 6 miles of stop-and-go driving with a full passenger load, the flywheel had run down to 1,500 revolutions per minute. It then needed recharging, which could be done by means of power outlets near passenger stops. The recharging took 2 minutes. Then the bus was ready for another 6-mile run.

With a stationary powerplant for the moon base, such flywheel-driven vehicles would be very practical for routine runs on the lunar surface. If there are a number of routine stops—say, lunar base, spaceport, astronomical observatory and so forth—cables could be laid to those points from the powerplant, with intermediate recharging points where necessary.

The problem of getting around on other planets resembles quite a number of other detail problems in space travel. Engineers have very definite ideas of how these problems could be solved. They could even build their solutions right now.

But these solutions are not needed here on earth. They are needed at the other end of the trip.

And the first problem is to get to the other end of the trip.



Plants Pick Up Radioactive Fallout

Evidence that certain plants pick up radioactive fallout "to an extraordinary degree" comes from an English scientist.

The plants are those having a low mineral intake and growing on extremely acid soils. One such plant is the bog moss Sphagnum papillosum, according to Dr. Eville Gorham of Ambleside, Westmorland, England. His studies on radioactive fallout accumulation are reported in the British scientific journal, *Nature*.

Strontium-90, since it is taken up by the bones in the body as calcium is, is believed to be the most deadly product for humans in radioactive fallout. Dr. Gorham reported that the high concentration of strontium-90 in the bones of upland sheep may be due partly to the animals' reliance on mosses for fodder, particularly in hard times.

The high radioactivity of plants growing on acid soils, Dr. Gorham said, is due to the fact that radioactive fallout accounts for a greater proportion of the soluble or adsorbed chemicals available to the vegetation. The radioactivity of such plants has increased as much as 50-fold in the past 10 years, he found by comparing specimens collected in 1958 with others collected prior to 1947.

Science Digest Dec 1954 Vol 36 #6

SCIENCE DIGEST
VOL. 36, #6
DECEMBER 1954

MYSTERY OF THE TINY PLANETS

by Willy Ley

Condensed from Galaxy Science Fiction

THIS YEAR marks the 60th anniversary of an important astronomical discovery which, however, did not then take place. Now this might sound confusing, so let me rephrase it by saying that 60 years have gone by since an important astronomical discovery could have been made.

If that is still not quite clear, it has to be said more bluntly by stating that Harvard College Observatory missed something important 60 years ago. Two years later, the astronomers at Arequipa, Peru, missed the same chance of amassing some fame. They both photographed Planetoid No. 433 and did not realize what it was that showed on their plates.

Of course, it is conceivable that they may have been somewhat tired of planetoids (or asteroids) by that time. The first one of that swarm of diminutive planets between the orbits of Mars and Jupiter had shown up during the night preceding January 1, 1801. Professor Giuseppe Piazzi, trying to correct a typographical error in a recently published catalogue of fixed stars, had noticed a faint star where there should be none at all. Further observation and a calculation of the orbit by Karl
Friedrich Gauss established that i
was not a comet, as suspected at first
but a small planet.

It was named Ceres and we no
know that it is the largest membe
of the Asteroid Belt, with a diam
eter of 480 miles.

In the late evening hours of Marc
18, 1802, an amateur astronomer
Wilhelm Catthaus Olbers, M.D. o
Bremen, found a second such plane
while on the lookout for comets. I
was called Pallas and turned out t
be the second largest, with a diam
eter of just a trifle over 300 miles
The same Dr. Olbers discovered on
more, Vesta, in 1807, but Vesta wa
already No. 4 for Harding had foun
No. 3, Juno, in 1804.

I haven't been able to discover ye
just why Dr. Olbers — indubitabl
the expert in this field, with two dis
coveries out of a total of four—be
lieved and convinced others tha
there were only four planetoids. Al
most a score of years passed unti
somebody decided to see whethe
there mightn't be more.

This skeptical character was, lik
Dr. Olbers, an amateur, one Mr. M
Hencke of Driesen in Germany
After fifteen years of search, he wa
able to announce the discovery o
No. 5, Astraea, thirty-eight year
after the discovery of No. 4, Vesta

Galaxy Science Fiction (Nov. '54), 421 Hudson St., New York 14, N. Y. Copyright 1954.

wo years later, Mr. Hencke in-
rmed the world that he had found
o. 6, Hebe.

Then others went to work. When
e 50th anniversary of the discov-
y of Ceres came around, No. 14,
amed Irene, had just been identi-
ed.

So far, the joy of discovery had
ot been tarnished, but then it began
be dimmed by sheer numbers. In
870, the number of known and
amed planetoids had grown to 110.
n 1890, it had increased to 300.

It was then that a Dr. Isaac Rob-
ts made a fateful suggestion. One
ould keep track of these little bodies
est by means of the photographic
late, he said. Astronomers previ-
usly had checked the actual appear-
nce of the sky, along the band where
e planetoids had to be, against star
aps. Anything that showed in the
lescope but could not be found on
e chart had to be either a comet
r a planetoid. It would be simpler,
r. Roberts said, to photograph
ese areas, following the apparent
ovement of the fixed stars with the
strument. The stars would then
how up as points, while things that
oved — comets and planetoids —
ould show as short lines.

Professor Max Wolf of Heidelberg
as the first to adopt this suggestion.
he results were simply disastrous.
es, you could check on known
lanetoids in that manner—but you
ould not avoid discovering dozens
new ones at the same time.

Within the four years from 1891
1895, no less than 107 new as-
roids were discovered! At the turn
of the century, the total number was 559, of which 452 had been numbered and named! Professor Wolf and his assistants had added more than a hundred to the 300 known in 1890. Prof. Charlois of Nice had added around 95, and Prof. Palisa of Vienna 83! C. H. F. Peters had found 52 or 53 and many others could boast half a dozen.

Naturally, there were countless duplications. The job of identifying the short lines on countless plates alone assumed almost superhuman proportions.

A rather fast-growing group of astronomers decided that all this was more or less wasted effort and skipped reports on *Kleine Planeten* when reading their professional journals. In this general atmosphere of "too much news," there came the evening of August 13, 1898.

The place was the Urania Observatory in Berlin. It had been planned to be "quite some distance" from the city so that the work of the astronomers should not be hampered by city lights. But by 1898, the city was already encroaching on it. By the time of the First World War, when I was old enough to pay attention to such things, the Urania Observatory was deep inside the city and was used for instruction and popular lectures only.

In 1898, the Urania Observatory boasted the biggest telescope—a 12-incher—in all Prussia and the chief astronomer, Dr. G. Witt, had installed some photographic equipment. He must have been short of funds, for the little box that housed we can say is that Eros, if dumped on Earth without shattering, would merely become our highest mountain.

Eros rotates around its axis and, while doing so, its brightness changes. This leads to the suspicion that it is not spherical, but of irregular shape.

In 1937, several astronomers published their observations and the conclusion they drew was that Eros might have a shape like a poorly formed brick. Assuming a density of 1.63 times that of water, they calculated that the longest axis of this "brick" was 21.5 miles and that the two shorter axes measured 13.0 and 10.1 miles. The shortest axis is the axis of rotation and the period of rotation was given as five hours an 16 minutes.

All this is still subject to corre tion and the figures may chan somewhat, but it can be taken f granted that Eros has an irregul shape that would be impossible f a body of much larger size. It is ve simply a huge mountain circling t Sun.

I may add here that its co-disco erer, Linke, has offered the sugge tion that Eros may not be a sing body, but several small ones rotati around their common center of gra ity. It's possible, but not establishe

At any event, planetoid No. 43 constitutes one of the strangest a most intriguing astronomical disco eries ever made.

Step Nearer to Photosynthesis Secret

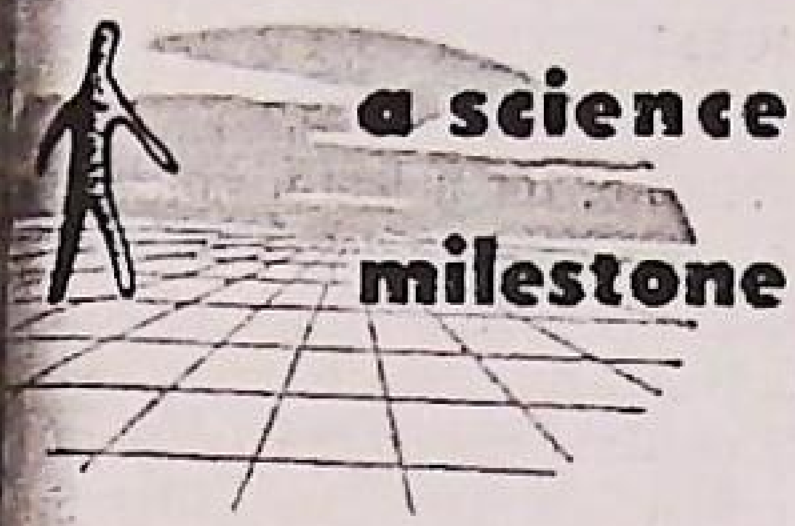
Scientists are a step closer to understanding photosynthesis, thanks to a California-developed method of extracting tiny "light converters" in plant leaves.

Three University of California researchers now have a method of separating and keeping alive these "converters," called chloroplasts. They have observed the first complete photosynthesis in the isolated units, and they have discovered a new process, heretofore unknown to science, by which plants convert light directly into chemical energy.

Doctor Daniel I. Arnon, professor of plant physiology, has told how he and two colleagues devised a way of breaking down plant cells without harming the chloroplasts. Using radioactive carbon dioxide, the California plant phys ologists measured the amount of carb hydrates manufactured by the chlor plasts in the photosynthetic process.

And they noticed something else w going on: Chloroplasts were converti light energy directly into chemical e ergy, stored in ATP—the same co pound we use every time we flex o muscles. Man, however, obtains h ATP from food, while plants make with light.

Doctor Arnon and his colleagues Dr. M. B. Allen and Dr. F. R. Whatle —believe their findings will help ove come one of the obstacles maki studies of photosynthesis difficult—t fact that heretofore it has been impo sible to take chloroplasts out of leav without stopping photosynthesis.



Banting and Best

Discoverers of Insulin

by Leonard Engel

N a rainy afternoon in April, 1921, a tall, somber young man ed the nose of his battered Ford the highway from London, On- o, to Toronto, a hundred miles y. Behind him lay darkness; d—perhaps more darkness.

His medical practice had been a ure. His childhood sweetheart grown tired of waiting for him ough medical school, through rld War I army service, through unavailing struggle to establish self as the first orthopedic sur- n in Western Ontario, and had rned his ring. He had given up part-time teaching jobs that had t him alive, and had sold his se. And for what? To go to the versity of Toronto to perform an eriment which had been per- med many times before by emi- t physiologists—and always un- cessfully.

But this unknown young man was succeed where the others had ed. This was Frederick Grant nting. Before the summer was , Banting and Charles Herbert t, a Toronto graduate student o gave up a desperately needed mer job to help Banting, would cover insulin. From the pancreas a dog, Banting and Best would extract the elusive hormone without which sugar piles up in the blood, while the tissues starve; the elusive hormone without which comes the slow, terrible death of diabetes. Banting's trip was one of the most fruitful in the history of science.

• • •

Frederick Banting was born on November 14, 1891, on a farm near Alliston, a pioneer town 40 miles northwest of Toronto. He was the youngest of four boys and a girl in the family of William Banting, whose father had carved the farm out of the Ontario wilderness, and Sarah Grant Banting, the first white girl born in Alliston.

By the time Frederick was born, the Bantings were comparatively prosperous, so Frederick was able to go through high school and then on to college. In college, his mother and father, who were devoted members of the local Methodist Church, expected him to prepare for the ministry. So did his sweetheart, the minister's daughter.

After a few months at a Methodist college in Toronto, however, Banting realized that medicine was his field.

Banting entered the University of Toronto Medical School in 1912 with a class whose training was first interrupted by World War I, and the small electric lamp illuminating the spider-web crosshairs had been made by the scientific staff out of a cigar box.

A more serious worry of Dr. Witt was that he did not trust the clockwork mechanism that guided the telescope. This can be corrected manually if somebody sees to it that a fixed star, picked for the purpose, does not leave its assigned place in the field of an auxiliary instrument. This job was done by a young student by the name of Felix Linke.

Linke told me later that there happened to be a heat wave at the time and that they were happy if there was a reason to go to the photographic darkroom, which was the coolest place in the whole observatory, but that the word "cool" applied only by comparison with the rest.

The program decided upon by Dr. Witt for the night of August 13 to 14 was to track down No. 185, Eunike. Eunike had not been seen for years. But if the old orbit calculation still held true, Eunike should be in the general vicinity of the fixed star *beta* of the constellation Aquarius.

The photographic instrument was pointed in the proper direction and Linke held it as steady as he could for two hours. Then Dr. Witt and his helper rushed the new plate to the "cool" darkroom and, after it had been racked up to dry, they went home to get as much sleep as the heat would permit. Next day, they went over the plate with a magnifying glass for planetoid tracks.

Eunike was where she was supposed to be, or very nearly so. Another known planetoid had also lef its visiting card. But near the sta *beta Aquarii*, there was another trac of unusual length. Dr. Witt though at first that this was no track, bu a flaw in the plate. Then he decide that it was a genuine track and, because of its unusual length, it had t be made by a fast-moving body. I could still be a comet, however.

In the evening, the 12-incher wen into action for direct observation The tiny "star" that had made th track the night before could be clearly seen. It was not a comet. Henc it had to be another new planetoid

The customary wires to other observatories were sent and quite a lo of observations accumulated durin the next six days. Then Dr. Berberich, the chief of the Computin Institute, which had been founde especially for keeping track of th minor planets, retired with all th observations of *Object* 1898 DQ an began to compute its orbit.

It turned out to be the most unusual orbit of any planetoid thus far Most of it was between the orbit of Earth and Mars. And its average distance from the Sun was smaller than that of any other.

It was for these reasons that Dr Witt insisted that 1898 DQ, or planetoid No. 433, should be given a nam which, by itself, emphasized that i was a special case. Starting wit Ceres, Pallas, Juno and Vesta, al planetoids had been given femal names, preferably classical. The new one was to receive a male name.

Doctor Witt selected Eros. The orbit computed by Dr. Ber- rich showed that the point closest the Sun, the perihelion, is only 13 times the earth's average dis- nce from the Sun. The point of arth's orbit closest to the perihelion Eros is passed by Earth every nuary 22nd. If it happened that ros passed its perihelion on that ate, or close to it, the distance arth-to-Eros would a mere 14 million iles.

This was consider- ly closer than any- ing else known at at time (not counting e Moon) because the osest Venus can come 20 million miles and e closest approach of lars is 35 million miles.

At the time of the actual discovery Dr. Witt, Eros had been near its helion and the question was—how ng one would have to wait to get close look?

Eros needed 643 days to go from rihelion to perihelion. It followed at Eros and Earth would be in the me direction, as seen from the Sun, proximately every two years and ur months.

But this still implies greatly vary- g distances. When had Eros been its perihelion, on or about January nd, any year? The answer was sappointing: it had been in Janu- y 1894, four and a half years be- re it was discovered.

When that date was established, a arch of old plates was made and it turned out that Harvard College Observatory had Eros on *seventeen* plates exposed at that time. And Arequipa had photographed it four times in 1896.

The next really close approach of Eros was not due until 1931, but for another one as good as the missed one in 1894, one must wait until Eros has completed 46 of its revolutions. This means 81 years, so that Eros will be a minimum distance again in 1975.

> **• While the telescope serves as a means of penetrating space, and of bringing its remotest regions nearer us, mathematics, by inductive reasoning, has led us onwards to the remotest regions of heaven, and brought a portion of them within the range of our possibilities.**
> **—Humbolt**

But in the meantime, astronomers have put Eros to good use even with somewhat inferior oppositions. The elementary and fundamental yardstick in astronomy is the "astronomical unit"—the distance of Earth from the Sun. By observing Eros, the value of this yardstick has been considerably refined. And as Eros comes inward in the Solar System, it is, of course, being acted on by the gravitational fields of all the inner planets. This fact can be utilized to determine the masses of the inner planets.

In the case of Venus, for example, the mass had to be derived in part from the influence of Venus on Mars. It was, to quote Dr. Paul Herget, one of the paradoxes of astronomy where "we photograph Mars to see how much Venus weighs." Photographing Eros for the same purpose gives better figures.

At this point, somebody is likely to ask about the mass of Eros itself. Well, that's not so simple. The best

Science Digest Sept 1954 Va 36 #3

SCIENCE DIGEST
VOL. 36, #3
SEPTEMBER1954

used to trap and catch a thief, who had been stealing the property.

After the next theft of property, several suspects were examined with the aid of an ultraviolet light. The shirt and hands of one of the suspects exhibited a tell-tale glow, and the law enforcement officials sent his shirt to the FBI laboratory. With it went a sample of the fluorescent powder that had been dusted on the government property. As a result, the infrared spectrometer showed that the sample fluorescent powder and the shining compound on the shirt were one and the same. The suspect then admitted his guilt in a court of law.

In the last ten years, the inf spectrometer has contributed to industry, medicine and crim tection. But, in the years to co promises to aid in bringing abo industrial revolution. Until o cently, the spectrometer was exclusively in laboratories.

However, because today more more infrared instruments are b moved right into the indus plants to keep a constant check chemical manufacturing proce the process chemist has another son for seeing the day draw when he will be able to ope complete, automatically contro plants.

Scientists Study Funeral Ship of Pharoah

Exploration of the newly discovered model of a ship designed to carry the soul of the ancient Egyptian Pharoah Cheops to its heavenly resting place may reveal to archeologists something more than the little now known about the life and character of that greatest Pharoah of a great dynasty.

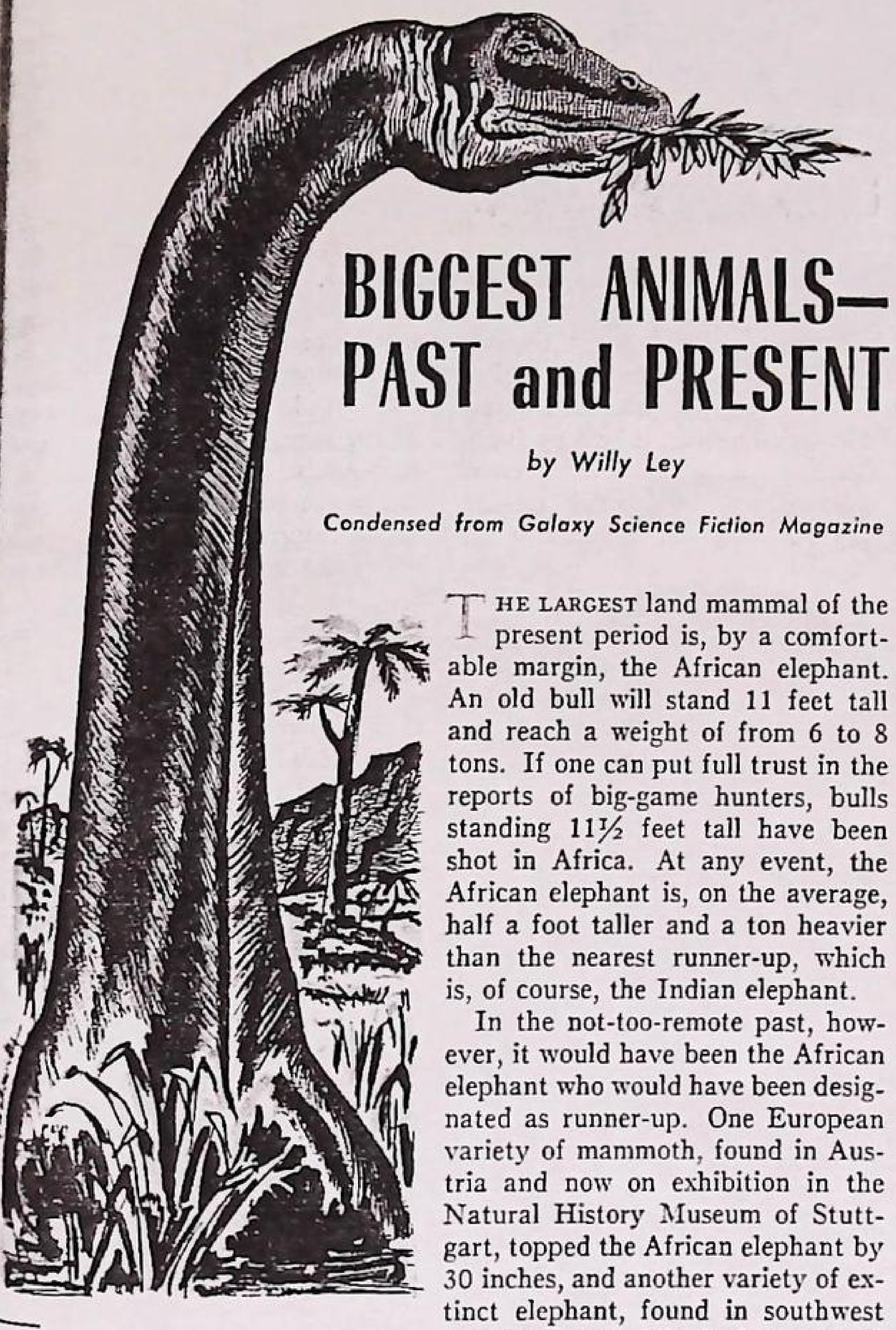
The ship was found beneath a road beside the Great Pyramid at Giza built by Cheops. The hull was cut out of the solid rock and the ship was sealed in by massive limestone blocks weighing 15 tons.

There is also a possibility that a second model boat may be found later. Two model boats formed a part of the standard tomb furniture of Egyptian burials. The dead man was entitled to claim a place in the boats of Ra, the day boat and the night boat, which represented the sun in its travels across the sky day and under the earth by night.

The Egyptians believed that the he en of the Pharoahs was located in t eastern part of the sky. Common pe ple went, after death, to the Ely Fields in the western co of the Underworld.

Archeologists also b that study of the boat b to ferry Cheops' soul m give scientists more inf mation about how the cient Egyptians constru the craft that plied the N

Comparable models of houses pla beside Egyptian tombs to serve a dwelling place for the soul have sh the development of architecture from primitive tent-like structure propp up with a couple of sticks to a two-sto house with furniture, arched roof a ventilators.—*Science News Letter*



BIGGEST ANIMALS—PAST and PRESENT

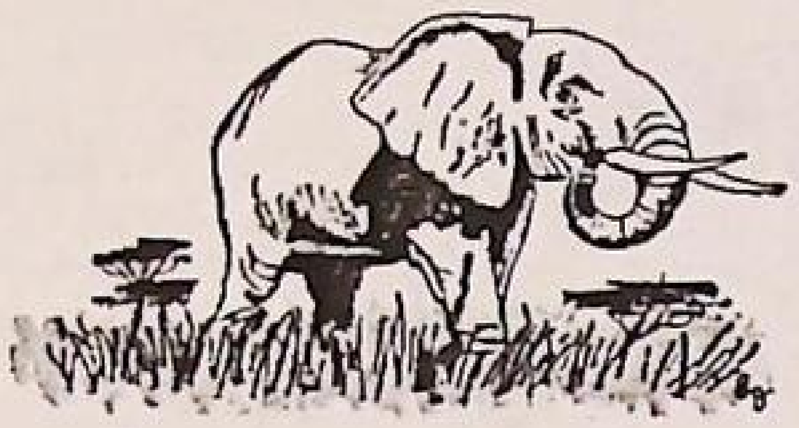
by *Willy Ley*

Condensed from Galaxy Science Fiction Magazine

THE LARGEST land mammal of the present period is, by a comfortable margin, the African elephant. An old bull will stand 11 feet tall and reach a weight of from 6 to 8 tons. If one can put full trust in the reports of big-game hunters, bulls standing 11½ feet tall have been shot in Africa. At any event, the African elephant is, on the average, half a foot taller and a ton heavier than the nearest runner-up, which is, of course, the Indian elephant.

In the not-too-remote past, however, it would have been the African elephant who would have been designated as runner-up. One European variety of mammoth, found in Austria and now on exhibition in the Natural History Museum of Stuttgart, topped the African elephant by 30 inches, and another variety of extinct elephant, found in southwest Germany near Wiesbaden, topped this giant by another 10 inches. →

Galaxy *Science Fiction*, 421 Hudson St., New York 14, N.Y. Copyright 1954 by Galaxy Publishing Corp.



THE AFRICAN ELEPHANT

Even this super-elephant, though, was not the largest land mammal of the past. The record, as far as present knowledge goes, is held by Baluchitherium, a "hornless rhinoceros" from southern Asia, which was 27 feet long and stood around 18 feet tall. The present Indian rhinoceros could have walked under a standing Baluchitherium without ducking.

But mammals do not live on land only. The marine mammals of today hold the record over everything else that ever moved, including the dinosaurs.

The largest whale is probably the kind called the Blue Rorqual. Even conservative naturalists grant this monster a body length of 80 to 85 feet. The weight of a fully grown specimen of this whale is estimated to be close to 150 tons. The large whales of today are considerably heavier than Brontosaurus, which i calculated to have weighed in at 3 tons on the hoof. The whales of the geological past, were far smaller than those of the present.

WILLY LEY, German-born rocket expert, has contributed to many scientific and popular publications. Although he is best known for his books and articles about rockets and space travel, he has written about many aspects of scientific fact, and of the history behind scientific research. Mr. Ley left Germany in 1935. He is now an American citizen, living in New York with his wife and two daughters.

• • •

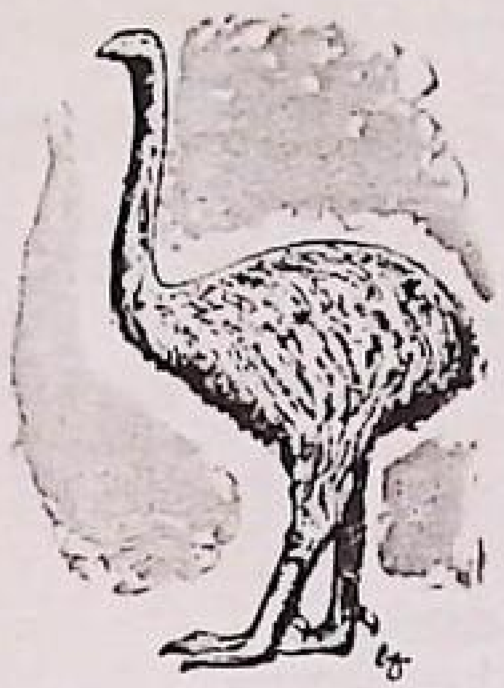
Proceeding to the birds, one a once gets into the dilemma of wha to go by, linear dimensions or weight. The bird with the largest wing-spread of the present time is the Wandering Albatross of South America. The largest ever measured had a wing-spread of 12 feet and weighed 15 pounds.

The condor, both South American and Californian, comes close with a maximum spread of just about 11 feet, but it weighs as much as 31 pounds. In the recent past, there was an even larger California condor that topped the wing-spread of the albatross and was probably heavier, too, than the existing type.

Naturally, the flightless birds are the biggest, for ground installations always weigh more than airborne equipment. The largest of today, the African ostrich, may look down at you from a height of 8 feet and weigh 160 pounds.

Only a few centuries ago, however, the African ostrich would have been runner-up to several other bird giants.

The biggest of the New Zealand moas, was not a lot taller (probably just a matter of inches), but must have weighed more than twice as much. This moa was certainly still alive in 1600, the date for which the giant ostrichlike bird of Madagascar is mentioned as still living.



THE NEW ZEALAND MOA

The Madagascar bird stood 10 tall. It was of lighter build than moa, but it did lay the biggest d egg known to science—almost inches long, with a cubic content al to that of 7 ostrich eggs or 185 of the kind that come by the zen.

The largest—or, rather, most mas-e—of extinct birds well known to eontologists was *Diatryma gigan-* of Wyoming. This heavy bird, sibly related to the cranes of to- had a skull almost 20 inches with a beak to match. Some feet tall when standing erect, it t have weighed well over 300 nds.

• • •

The fishes are another class where present holds its own well as pared to the past, even though to be admitted that the record-ers belong to an ancient type— ly, the sharks. The basking k is known to reach a length of to 35 feet, while the whale shark, ntly made famous by Thor Hey-hl and his *Kon-Tiki* expedition, is well established with 45-foot specimens, and even 60 feet has been tentatively accepted as a possible maximum size.

Past geological periods have not yet furnished anything larger than the whale shark among the extinct fishes.

• • •

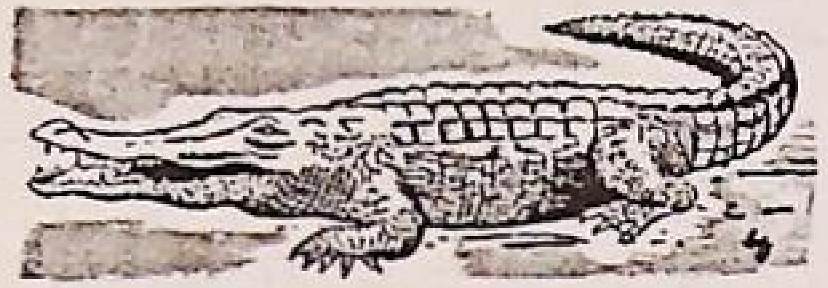
Now don't dismiss the invertebrates as tiny. True, they usually are, for a 1-inch beetle will be considered a big fellow and a 6-inch earthworm "enormous" and the African snail, which the Japanese spread over a large number of Pacific islands as a food supply during the Second World War, is known as the "giant snail." Its shell is 5 inches long and its overall length 9 inches; it is the second largest of the land snails of our era. The largest, also African, is about a foot long. But there are a number of other impressive exceptions from the rule that most invertebrates are small.

The largest clam of our time—and of the past, too, as far as is known—occurs near the Philippines, on the Great Barrier Reef of Australia and generally in that area. It can reach a size of 5 feet and a weight of 500 pounds.

• • •

We now come to the reptiles and there, as everybody knows, the past greatly outshines the present. But the present is not doing as badly as most people think.

The large Indian crocodile, which shows a most remarkable preference for salt water and long swims in the ocean, would not look too much out



THE INDIAN CROCODILE

of place in a landscape from the age of dinosaurs. One specimen, of which the skull is in the British Museum, has been found to be 33 feet long, with a circumference of 13 feet 8 inches!

The largest living turtle is a hefty animal, too. It is the leatherback turtle of the high seas, which grows to an overall length of 9 feet, the carapace measuring 6½ feet, and the weight of such a giant is an authenticated 1,450 pounds.

The largest living snake is the South American anaconda, of which many a wild tale has been told. Zoologists usually say that this snake will reach a length of "well over 20 feet" and generally will be willing to settle for 25 feet as the limit. But one reputable source mentions a specimen that measured 30 feet. However, it was measured after death (understandably so) and if you stretch a dead snake of such length for measuring, you may add one or two feet to its "live length" without meaning to.

The largest lizardlike reptiles of today are, of course, the monitors. The East Indian monitor grows to a length of 10 feet while the still larger monitor from the small island of Komodo in the Sunda Sea is 2 or 3 or maybe even 4 feet longer. Both are very long-tailed, so that the figures are slightly misleading. The heaviest Komodo monitor actually weighed was just about 100 pounds.

Although all these are respectable figures, they shrink by comparison with reptiles from former geologic periods. Only some 20,000 years ago, Australia had a monitor lizard that was more than 20 feet long and may have reached 30 feet.

The largest extinct reptiles were the sauropod dinosaurs of the type of the well-known Brontosaurus illustrated on page 19. Diplodocus was probably the longest because of an elongated tail; measurements between 70 and 75 feet from nose to tip of the tail.

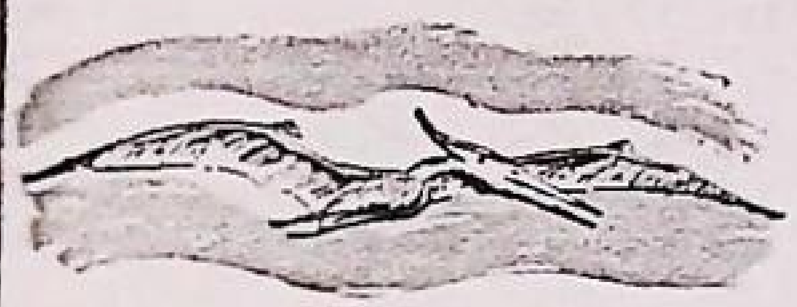
Not longer, but more massive by far, and probably the heaviest of the dinosaurs was Brachiosaurus from Africa. The length of the humerus (bone of the upper arm) of Brachiosaurus is 84 inches, as compared to 47¼ inches for the same bone in Diplodocus. Brachiosaurus could still breathe while walking along the bottom of a 40-foot-deep lake!

Tyrannosaurus [pictured on the front cover] was the largest meat-*eating* land animal the world has ever known. It, too, of course, was one of the dinosaurs.

The largest leatherback turtle would look quite small next to Archelon of Kansas. This turtle of some 60 million years ago must have been 13½ feet long when alive and heavy in proportion, presumably around 3,500 pounds.

For company, Archelon had 2 foot Mosasaurs, swimming reptiles with four big paddles, a flat tail and large teeth.

Above the waters where Archelon and the Mosasaurs competed for fish, the largest flying animal of all earth's history wheeled on leathery wings, also looking for fish. This was Pteranodon—mostly wings, with a ridiculously small body and legs, but with a large though paper-thin skull and a long sharp beak. The wing-spread of one specimen has been computed at 26 feet 9 inches.



PTERANADON

The amphibians of today are generally small. A 10-inch salamander is "big" and a 2-pound toad something worth mentioning. Still, in Japan there lives a salamander, called Hanzaki and Hazekoi by the Japanese, which grows to slightly over 5 feet in length. It is the largest living amphibian.

To find really large amphibians in the geologic past, we have to go back to before the dinosaurs to encounter the Labyrinthodons, so named because of the strange construction of their teeth. One species from northern Europe had a 3-foot skull and an overall length of about 12 feet.

• • •

The largest molluscs are the giant squid, the *Kraken* of the Norse, but unfortunately nobody can give any definite figures. One killed by the crew of the French corvette *Alecton* in 1861 could not be actually measured, since the crew of the ship, although they tried hard, failed to hoist it aboard. But the monster was directly alongside the ship, so that a good and reliable estimate could be made—50 feet without the tentacles!

No giant fossils of a comparable type are known, but armorless octopi would hardly fossilize. They would be eaten by a large variety of marine creatures before mud or sand could cover the body. However, some octopi produce shells the way the living nautilus does and such shells fossilize easily. You can see long rows of these ammonites in every museum.

The largest known was found in a quarry at a place named Seppenrade in Westphalia in 1895. The diameter of the shell is 8¾ feet.

A 12-foot earthworm may sound unlikely, but such earthworms exist in Australia. They have as many as 500 segments and are fairly thin when extended, about ½ inch.

• • •

When it comes to insects, one has to ask, of course, "What kind?" The largest living butterfly is a moth and so are the runners-up. The record is held by the South American owl moth with a span of 11 inches. The south Asiatic Atlas moth measures 10 inches in wing-spread, but has much wider wings than the owl moth.

Among the beetles, the elephant beetles of South America and the Goliath beetles of Central Africa run in very close competition, both being 4 inches long in good specimens. The

2000-
circa
received

CHARLEY JONES' LAUGH BOOK MAGAZINE

207-723	5.00	1952—Nov (VG)
207-722	5.00	1953—May (VG) Earl Wilson
207-721	5.00	1953—Jun (VG) Earl Wilson
207-720	5.00	1953—Jul (VG) Earl Wilson
207-719	5.00	1953—Aug (VG) Earl Wilson
207-718	5.00	1953—Sep (VG) Earl Wilson
207-717	5.00	1953—Oct (VG) Earl Wilson
207-716	5.00	1953—Nov (VG) Earl Wilson
207-715	5.00	1953—Dec (VG) Earl Wilson

CHESTERTON REVIEW

910-307	4.00	1979/80—Fal/Wint (VG) G. K. Chesterton
910-308	4.00	1982—Aug (VG) G. K. Chesterton
910-309	4.00	1983—May (VG) G. K. Chesterton
910-310	4.00	1983—Aug (VG) G. K. Chesterton
910-312	4.00	1984—Feb (VG) G. K. Chesterton
910-314	4.00	1984—Nov (VG) G. K. Chesterton
910-315	3.00	1985—Feb (G-VG) G. K. Chesterton
910-316	4.00	1985—May (VG) G. K. Chesterton
910-317	4.00	1985—Aug (VG) G. K. Chesterton
910-318	4.00	1985—Nov (VG) G. K. Chesterton
910-319	4.00	1986—Feb (VG) G. K. Chesterton
910-321	4.00	1986—Aug (VG) G. K. Chesterton
910-322	4.00	1986—Nov (VG) G. K. Chesterton
910-323	4.00	1987—Feb (VG) G. K. Chesterton
910-324	4.00	1987—May (VG) G. K. Chesterton
910-325	4.00	1987—Aug (VG) G. K. Chesterton

CHILDREN OF THE NIGHT

681-577	15.00	# 1 (VG) Horror Movies
681-576	12.00	# 2 (VG) Horror Movies
681-575	10.00	# 3 (VG) Horror Movies

CINEFANTASTIQUE

679-933	7.00	1981—Fall (VG) Altered States
673-843	7.00	1982—Feb (VG) Ghost Story
		(VG) Tales From The Crypt

COMPLETE WESTERN BOOK

941-130	6.00	1950—Feb (G-VG) Lee Floren; Dean Owen; Frank P. Castle
348-746	4.00	1951—May (G-VG) Joseph Wayne; Dean Owen; Giff Cheshire
348-574	8.00	1952—May (VG) Paul Evan Lehman; D. B. Newton
348-573	8.00	1954—Jun (VG) Lewis B. Patten; Peter Dawson

CONADIAN

347-255	20.00	Souvenir Book of the 1994 World (VG)

CONFESSION NOVEL OF THE MONTH

348-519	15.00	1940—May, #1 (VG) Swastika Bride

CONFIDENTIAL DETECTIVE

683-490	10.00	1946—Dec (VG)

CONFLICT

671-369	20.00	1953—Fall (VG) William P. McGivern; Charlotte Armstrong; Roy Huggins

CONFLICT LIBRARY

515-283	2.00	#345 (VG) The Giant Bomber (Paperback Sized Comic)

CONNOISSEUR'S WORLD

710-421	12.00	1964—Apr (VG) Ray Bradbury

CORONET

207-710	10.00	1937—Jan (VG) Donald Hough; Willy Ley; H. G. Wells
207-709	8.00	1938—Jan (VG) Manuel Komroff; Bernard Geis; Fred C. Kelly
207-708	5.00	1938—Sep (G-VG) J. H. Wallis; Cyril Hume; Arnold Zweig
141-362	6.00	1947—Jan (VG) John W. Vandercook
141-363	6.00	1947—Mar (VG) Emile C. Schurmacher
141-367	6.00	1947—Nov (VG) Article on Thornton W. Burgess
141-368	6.00	1947—Dec (VG) Many Hollywood Pictures
141-376	6.00	1949—Jul (VG) Ozzie Nelson, South Pacific

CORR

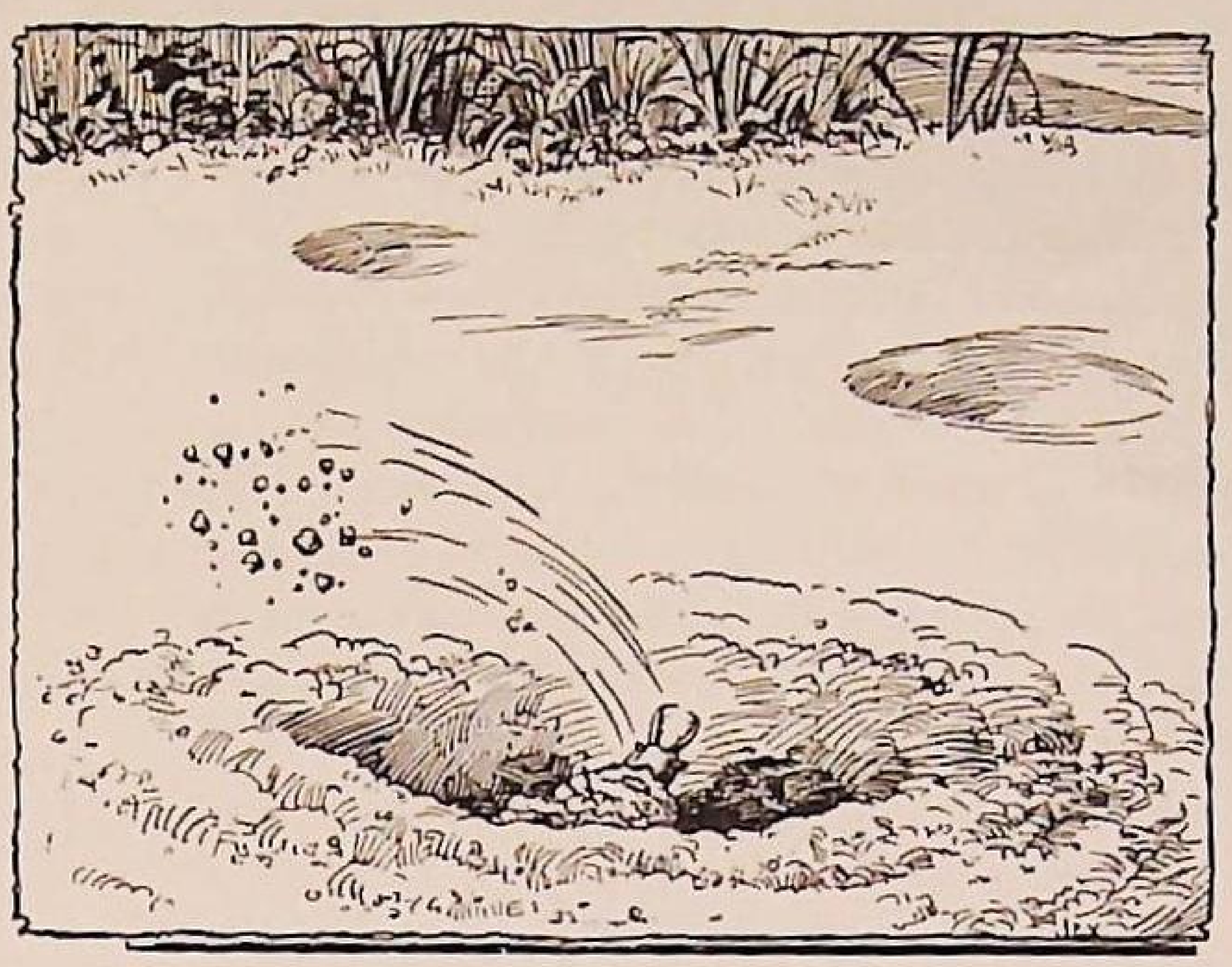
924-026	2.00	# 2-1/2 (VG) Poetry by Jim Corrick
924-027	3.00	# 3 (VG) Fan Fiction and Poetry Includin Geary Gravel

INSECT OF PREY

The story of the wily ant-lion, master strategist

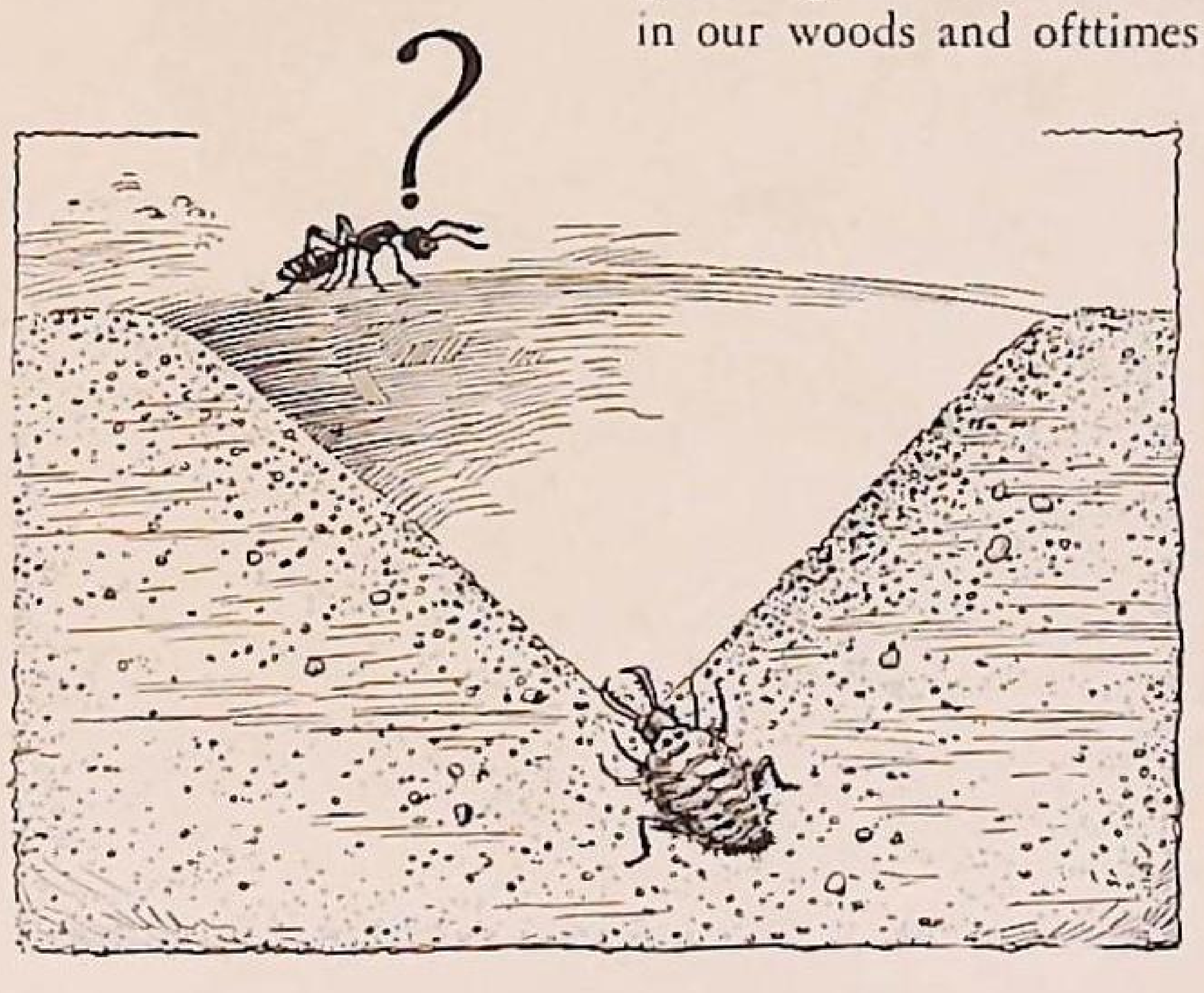
By HIRAM JEFFERSON HERBERT

Illustrated by Jex



•
•
•

FROM the histories of bygone heroes we gather strange facts. Progressive people of ancient days have contributed curious and interesting stories that tell of shrewdness and strategy. With much zest we read of the slight Napoleon, the amazing fire of the youthful, ambitious Alexander. The exploits of Tamerlane the Tartar are sources of rare wonder. At these things we marvel, yet in the world of insects we find histories and strategies that greatly surpass the accomplishments of man.



One of the most interesting of these creatures is this Insect of Prey. It makes a cunning practice of the nicest piece of strategy imaginable. It is a carnivorous insect.

By carnivorous I do not mean to imply that this interesting little insect stalks about in search of dead meat upon which it may feed. Neither does it await being fed by the hand of some keeper or slave that it has conscripted. Quite the contrary, this amusing little rascal falls entirely upon its own effective resources and depends upon no one. It is gifted with remarkable powers of subsistence and is endowed with a great deal of common sense.

This little fellow is named the ant-lion, not because it looks like either the ant or the lion, but because of its curious tactics. There is, however, some excuse for the fearful name from the mythological creature of antiquity which was reputed to be half lion, half ant, dashing about through the forests to frighten our foresires nigh to death.

Its life cycle consists of three definite stages well familiar to us: the egg, the larva, the adult, of which the larva is the most interesting. This is of particular engagement because of the fact that the larva seems to bear the ear-marks of a perfectly developed, well-rounded insect. Its behavior and its astounding adaptation to its manner of living make it an exceptional study in insect life. So we will pass over the fact that an egg deposited in the dirt, which hatches into a "bug," which in turn and time weaves a perfectly round cocoon hidden in the soil, finally emerges as a fly similar to some of the smaller dragon-flies. Having done this, we will get along to one of the most interesting creatures found in our woods and ofttimes in our gardens. In my path leading to the spring they are constantly active between the stones.

To begin with, our ant-lion seems to possess uncanny knowledge of the characteristic curiosity of ants. He gives astounding evidence of knowing that every self-respecting ant while cruising about amongst the leaves and poking her "brainy" antennæ under twigs and around stones is doing so because of her inborn efficiency. She is a very thorough and painstaking insect, more so than any other, leaving nothing within her province unexplored and taking absolutely nothing for granted. She must obtain first-hand information which she will hand over to her superiors upon returning to the formicary (ant nest) after the day's journey.

The ant-lion knows that mademoiselle ant will not overlook approaching the brink of every nook and cranny . . . and *pit!* Always, upon perceiving a hole in the ground, she will hasten to its edge and peer carefully into its depths. If this happens not to satisfy her insatiable curiosity, further exploration is required. She will then proceed to descend the side of the pit, and that incautious step is very, *very* much to the ant-lion's liking—and rather necessary to his code of living in the manner mains of the ice-age, when many of these were engulfed.

After the period of great value (equal weight in pure gold!) the price dropped. This was probably due to the fact that too many horns of the verum type were discovered, and also that the patients could not help noticing that the treatment with the precious medicine failed to cure the diseases for which it was prescribed.

The question still remains, however, was there ever such an animal as the Unicorn. It is, of course, unlikely that the animal with the magical qualities actually existed, but it is also unlikely that the story was based only on the evidence of the horns.

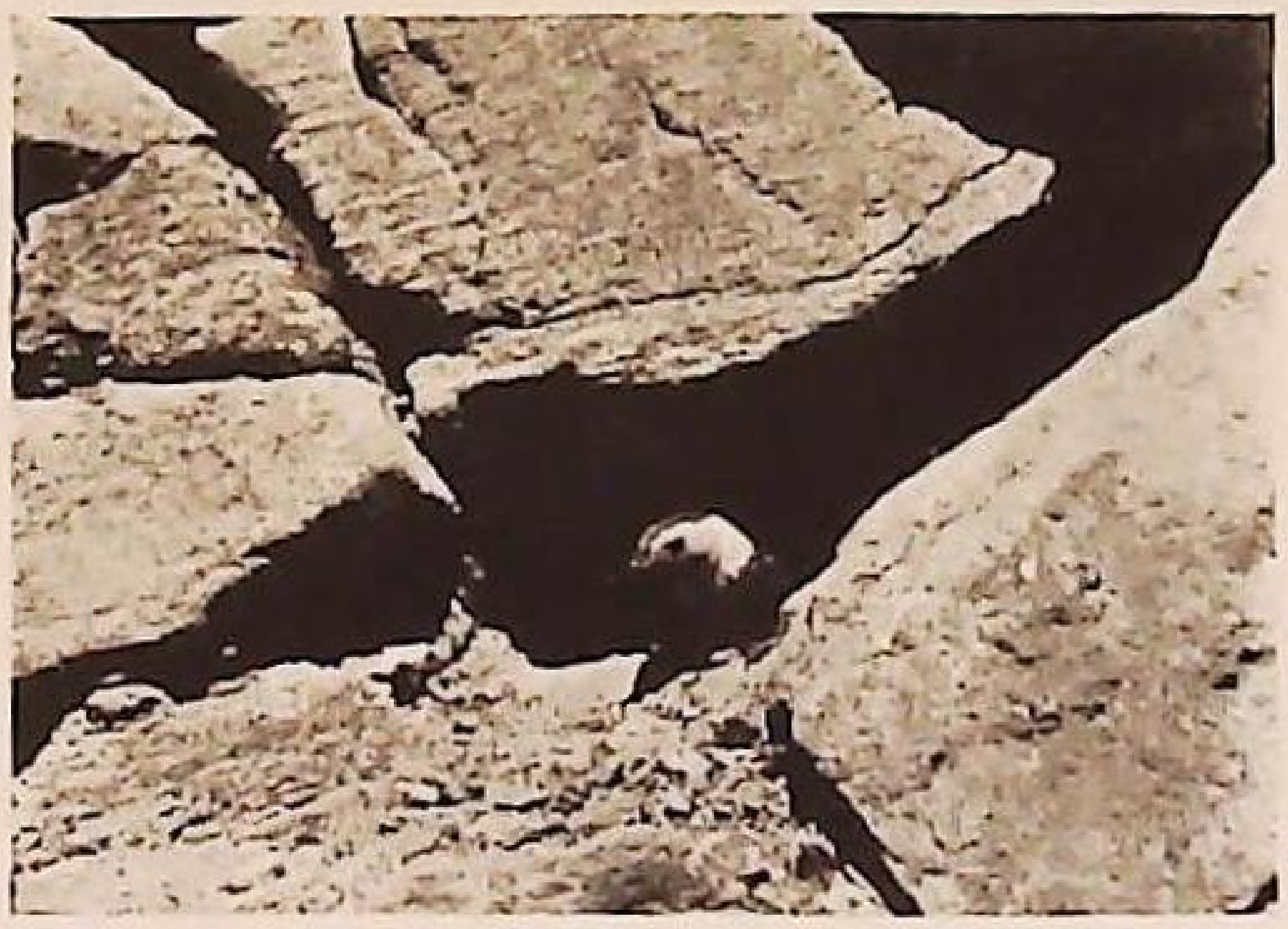
There are three scientific theories as to the origin of the fable. The first believes that the Unicorn is nothing else than a misinterpreted and "idealized" rhinoceros. The second theory also credits a rhinoceros, but an extinct one. At the end of the ice-age, and probably many millenniums afterwards, a large animal, the *Elasmotherium,* lived in Siberia. The *Elasmotherium* was distantly related to the rhinoceros, but seemingly was not so bulky and had its horn in the middle of its forehead instead of on the nose. Old folk-songs of the Tungus, a tribe of the Siberian steppes, still tell the stories of the battles their forefathers fought against the *Elasmotherium.* The legends say that this was the animal the Ice-Giant rode when he drove out Adam and Eve from Paradise.

A third theory, and probably the one most near to the truth, was suggested by the German scientist, Professor Dr. E. Schrader. Schrader believes that Ctesias found in Persepolis pictures of the R'ém, the wild ox, showing the animal in profile so that it seemingly had only one horn. The Persians did not know the real wild ox. It was already extinct in their country, although it continued in northern Europe (for example in Poland) a few centuries later. So Ctesias already may have been supplied with a flock of fables when he first saw the picture of the animal and the fabulous Unicorn came into being through a series of misunderstandings.

•

Rocky Mountain Nuthatch

By P. B. PEABODY



TWO DIFFERENT NEST SITES

Homes of the Rocky Mountain nuthatch under shale and in a typical tree hole

A little gay-gallant is the vivacious male nuthatch. Canny, too, he is in deluding any snooping human while he is feeding his mate upon her nest. But I managed, once, to outwit a Rocky Mountain nuthatch that was bringing food to his female who was brooding seven eggs in a big hollow of a ponderosa pine. Cautious at first, just so soon as he realized that "the jig was up", he came and went with fair brávado, entering the nest-hollow sometimes above the core of the limb, and sometimes below it. This type of nesting place is quite unusual with the Rocky Mountain race.

Cruising, one May day, along interminable Wyoming shale hills, I caught a quick vision of a female nuthatch flitting along a slit between two shale slopes. Instantly she disappeared into a sloping bank. Carefully I lifted the loose pieces of shale, revealing a narrow hollow. A probing finger brought me a sharp peck for my impudence. But this daring creature kept plumping out from her nest-cranny after I had driven her in, defiant of my camerizing. Her nest was the usual loose aggregation of vegetable "loot", blended with fur of rabbit and mouse retrieved from excreta of coyotes.

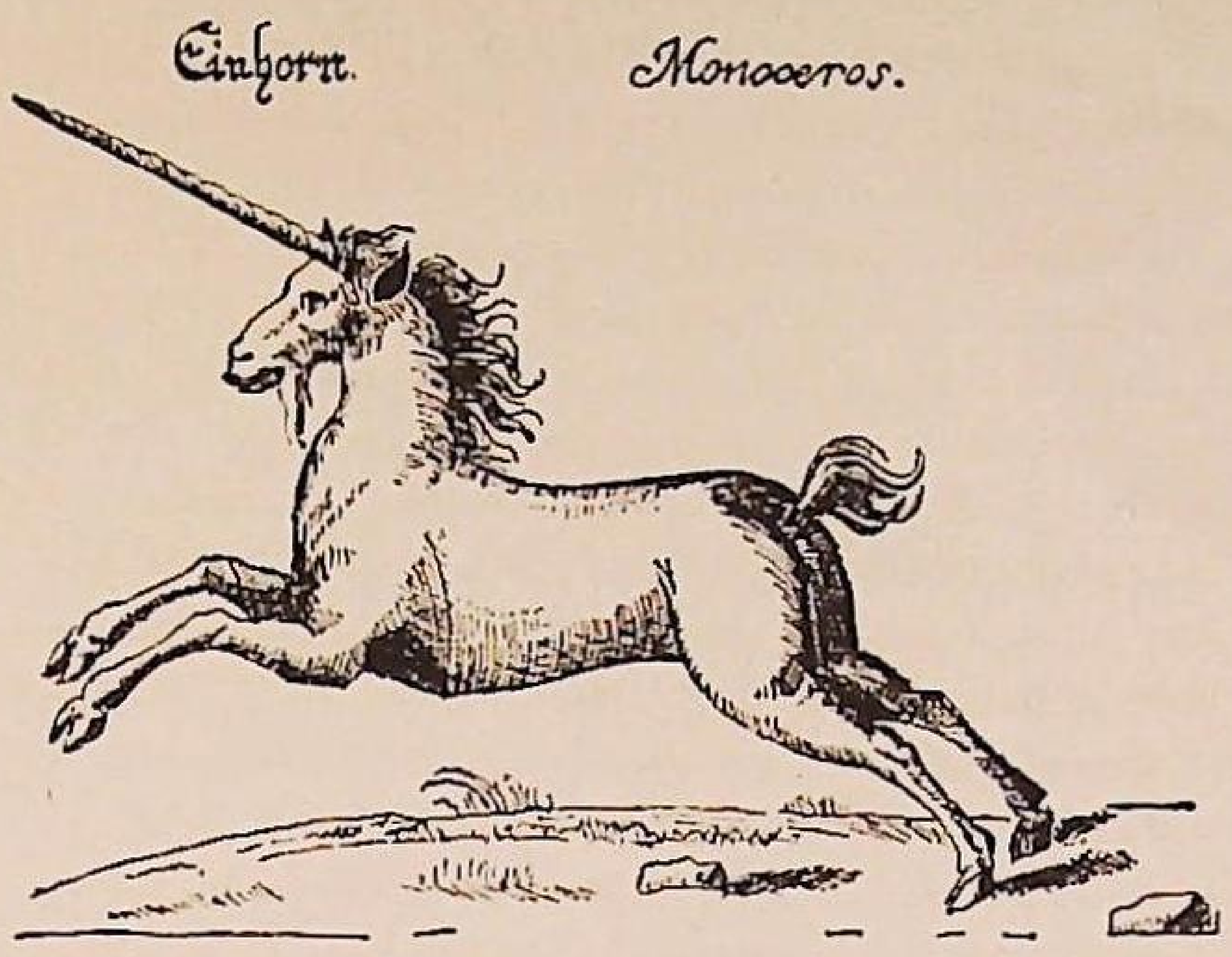
There came a day of rare excitement. Upon the bed of a wild, narrow canyon, bristling with dead cedars and living pines, I followed the winding stream bed upward. With sharp suddenness a mourning dove flushed noisily, and disappeared up the canyon. Instantly the trained eye caught just a glimpse of a fugitive bit of gray, rising just beyond her and disappearing on the nearby slope.

A female nuthatch it was, with tail bent indicating nest-narrowness. Then, slowly and stiffly she hobbled along. Repeatedly she shook herself, proof that she had just left her nest. A second or two later her mate appeared, out of nowhere, with a bit of food in his beak. Instantly the female took it and disappeared under a slab of sandstone beneath a great pine. Beneath that slab, in a flimsy nest, were five pearly-white eggs, faintly specked with pale-brown.

So I counted the day well-spent.

The Mystic Unicorn

By WILLY LEY



THE UNICORN ACCORDING TO ONE ARTIST

The Greek word, Monokeros, means "one, or single horn" and crept into Biblical lore

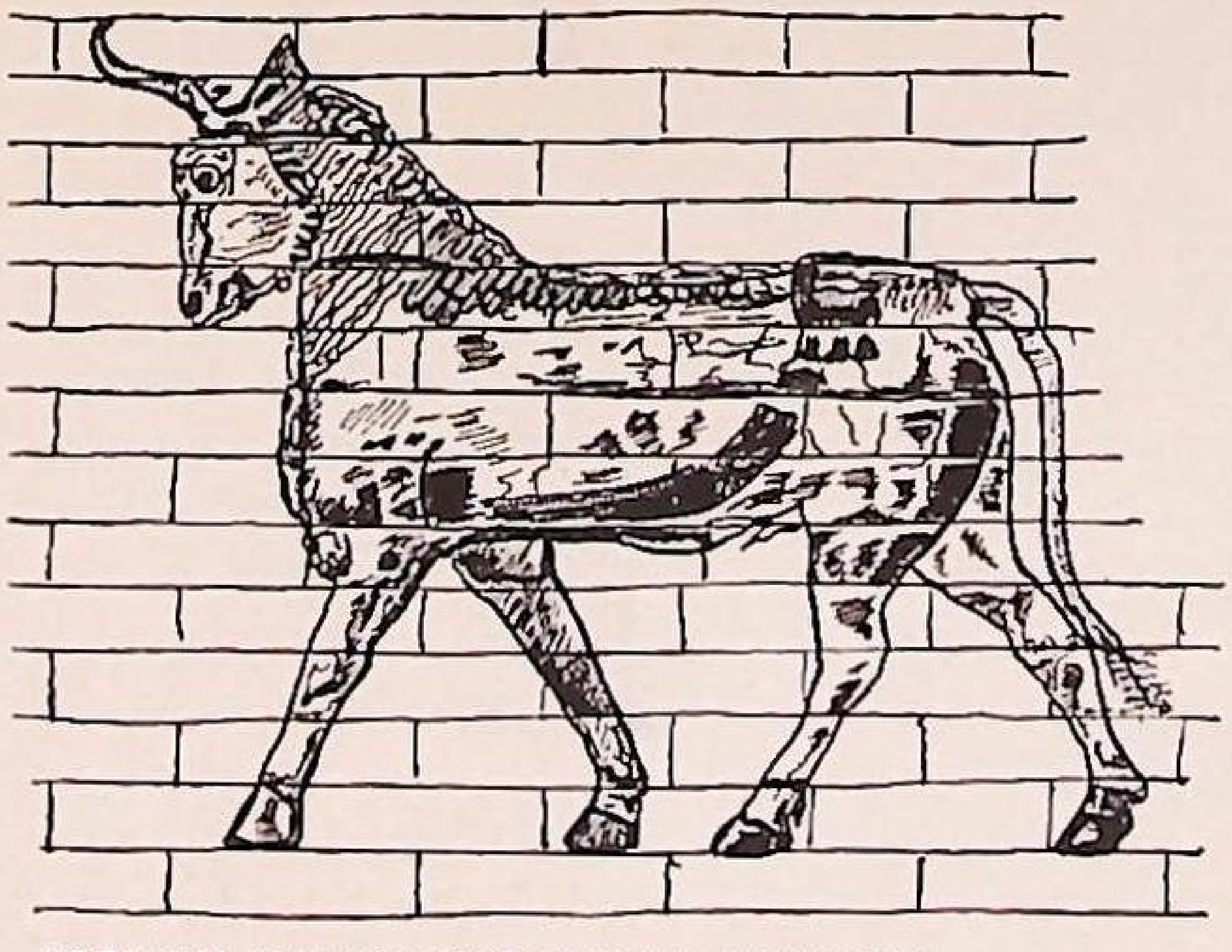
THE STORY of the Unicorn begins with a mistake in the translation of the Bible. In some passages of the Old Testament a beast is mentioned "that never will be the servant of man." The Hebrew word for this animal is *R'ém* and it means the now extinct wild ox. In the translation of the Septuagint, however, the Greek word, *Monokeros,* is used, apparently because the story of a one-horned animal that was said to have great strength and fierceness was already well known. The word, *Monokeros,* which means "one, or single horn," was translated into the word *Unicornis* in the Vulgate—*Unicornis* being the Latin equivalent for *Monokeros.* So the Unicorn found a place in the Bible.

The Unicorn existed already in the Persian literature, antedating the Septuagint. It dated back to Ctesias, body physician of the Persian king, Artaxerxes II. Ctesias said in his description of India that there were wild asses, famous for their great running speed and similar in appearance to a horse. The colors were black, white and red and they had a single long and twisted horn in the middle of their foreheads. This horn, Ctesias emphasized, would be valuable as a drinking cup, for this material would inevitably prevent poisoning.

Such was Ctesias' story and all ancient authors copied it, each giving the Unicorn a few more features, such as the cloven hoofs of a goat, the hind legs of an antelope and the tail of a lion, or sometimes that of a pig!

Ælianus, a Roman author, stated that the Unicorn was sometimes also called *Carcazonon,* possibly a distorted form of the Arabic word, *Carcadan,* for rhinoceros. It must be remembered that the rhinoceros, although it does not look like it, is capable of swift motion and has all the strength the Unicorn was said to possess.

The horn of a Unicorn that was presented to Pope Gregory XIV in 1590 by the Prior and Brothers of the Monastery of St. Mary Guadalupe, Spain, was actually the horn of a rhinoceros. This was learned several centuries later, when in 1909 this famous horn was offered for sale. It has now its place in the American Museum of Natural History, New York, in the Hall of South Asiatic Mammals. The tip of the horn is missing. It had been ground to powder and administered to Pope Gregory during his last illness.



POSSIBLY THE SOURCE OF THE UNICORN

A drawing, probably of a wild ox, showing one horn and perhaps giving birth to the Unicorn

But the mixing up of the wild ox and the Unicorn on one side, and the rhinoceros and the Unicorn on the other side, is not the whole story.

When, in the Sixteenth Century, the Swiss naturalist, Konrad Gesner von Zürich, who has been termed the German Pliny by the French and the father of modern zoology by the Germans, was busy with his collections of material about all known species of animals, he hesitated when he came to the Unicorn. Frankly, he did not believe the story. Being the city physician of Zürich, he was well acquainted with the use of Unicorn horns in prescriptions for wealthy patients. It was said to be the most potent medicine on earth. Certainly it was the most expensive! Gesner himself had prescribed it from time to time, but he confessed in his medical books that he never, when the patient insisted on the prescription of Unicorn horn, forgot to prescribe other medicines too!

He could not deny the fact that Unicorn horn existed in the pharmacy shops, and he was also quite sure that it was not rhinoceros horn.

In those times Unicorn horn was on sale in every large drug store and the pharmacists carefully distinguished between "unicornum verum" (true unicorn) and "unicornum falsum." Unicornum falsum was the horn, or rather the tusk, of the male narwhal, sold at exorbitant prices by northern fishermen who kept its origin secret. Unicornum verum, to be genuine, must have had its origin in the earth. Some of them have been preserved in European museums, revealing that they are nothing else than tusks of ancient elephants, found frequently all over the European plains, part of the rearising from wet leaves, damp pine-needles, misty myrtles. Through the plumed and purple tops of the pines the starlight steals wildly yet softly. From broom-sedge and white sand and warbling water clean aromas exhale. It is the hour of Nature's brimming chalice.

After a while the woods begin to be full of subtle movements of the wild creatures; there are subdued crackings of dry branches and twigs; there are sinuous brushings aside of bay-bushes and gall-berry plants; there are wary footfalls, almost soundless, yet audible. The barred owls and the great horned owls hoot, scream, and weirdly intone their occult callings and challenges. I hear an old foraging raccoon grunting in the bosky green darkness of a watercourse. All about me there is the sense of a host of shadowy creatures, near yet invisible; intensely wild, yet close to me. I identify them by the little noises that betray their presence and their identity. In the brightening starlight I can barely discern a few of these. That eerie form, looking almost black in the white road, is a gray fox; that stolid lumbering shape that looks almost white against the dark pinestraw of the forest floor is a 'possum, a strange Dickens-like character in the community of wild Nature that just wheedles his way through life. Little elfin noises in the bushes and the grasses and among the fallen pine cones tell me that the wood-rats and wood-mice are frolicking and feeding. It is strange, but one of these humblest rodents makes almost as much sound in moving about at night as does a deer, the noblest game of that country. He is the very spirit of the night: secret, star-wild, vanishing. I know now that deer are abroad in the dusky woods within easy sight, if it were day; but they are invisible, and the few sounds they make seem but a part of the wide mysterious whispering of the forest. Yet now I know that I shall see some of them, for that conflagration in the east, where a thousand pines are beginning to burn, is the rising moon.

From my station, which has been by the darksome borders of a gum and tupelo swamp, I move up a little woodland hill, where the forest is open and parklike. On my way, wild things get my scent, and scuttle or dash softly or crash away, the manner of their flight being determined by their size and their temperaments. By the time I reach my new position, moonlight is flooding the woods, and that mystic radiance has both a revealing and a concealing power. Here I will sit until deer come by me in the moonshine, as I know they will; for over this little rise runs one of their favorite paths. While they wander and stray a good deal to feed, they have standard highways; and from plantation records, that go back as far as the year 1686, I have reason to know that the wild deer are now using the same pathways through the woods of home as they did three centuries and a half ago; and likely for ages before the coming of the French Huguenots.

Often have I watched deer by moonlight; sometimes from the ground, sometimes from a platform in a tree. On this particular evening I was just sitting on an old pine stump. Moonrise in the pinelands is the witching hour, when every scar is magically healed; when every object, however obscure and mean its aspect by day, is wrought to virginal marble by an all-forgiving wand, is statued in lily-white stone. The beauty of the moonlight has always seemed to me not so much a thing in itself as its transforming and transfiguring power. In that it is like love.

I have a long wait; but who will not wait amid deepening peace and increasing loveliness? At last they come: two fairy shapes, silent, elusive, beautiful. The mild night air is drifting from them to me, so that they do not detect my presence. Here are two great silver stags, with silver horns, moving with unpostured grace through a silvery world. They pause, as if posing for an argent picture. Nearer they come; and I notice that at certain angles in the moonlight they are almost invisible; at others they are vividly visible. Past me they glide, like spirits of the wilderness, having all the meaning connoted by the night, by stillness, and by the unwearied charm of Nature. Into the silver silences they vanish.

In these pinelands there formerly were many homesteads, now not only deserted but so completely disappeared that their sites are marked by nothing but a few live-oaks that seem memorial. The mocking-bird is not usually a dweller in the woods; but often a pair will be found in one of these oaks, the trees and the singers continuing the tradition of former human habitation. As I leave my station to turn homeward, in the lonely moonlight, I hear a mocking-bird filling the tender silence with ecstatic song. On quivering wings he rises, singing in his flight, flying as if on the wings of song. It is to this melody that I walk back to the plantation road, reaching it as the real deep of night comes on. To me there is something strangely unexpected in hearing a mocking-bird choiring in the pinelands, something as disconcerting as a baby's sigh; as if I had not really understood all that was in a heart that I thought I knew.

Yes, romance is in the pinelands; often when dawn spreads over them the streamers of her wide effulgent banners; often when those solitudes are shaggy with twilight; but most, I think, when night there ascends her lonely fragrant throne. For then the soul, like some shy flower, opens wide under the light of stars. . . . Night in the pinelands has brought me great happiness; and happiness is power, though power is not happiness.

●

We are happy to announce that another article by Mr. Rutledge will appear in the March issue of Nature Magazine, combining, once more, his understanding knowledge of wildlife, his philosophy of the many values of our outdoors and his outstanding literary skill.

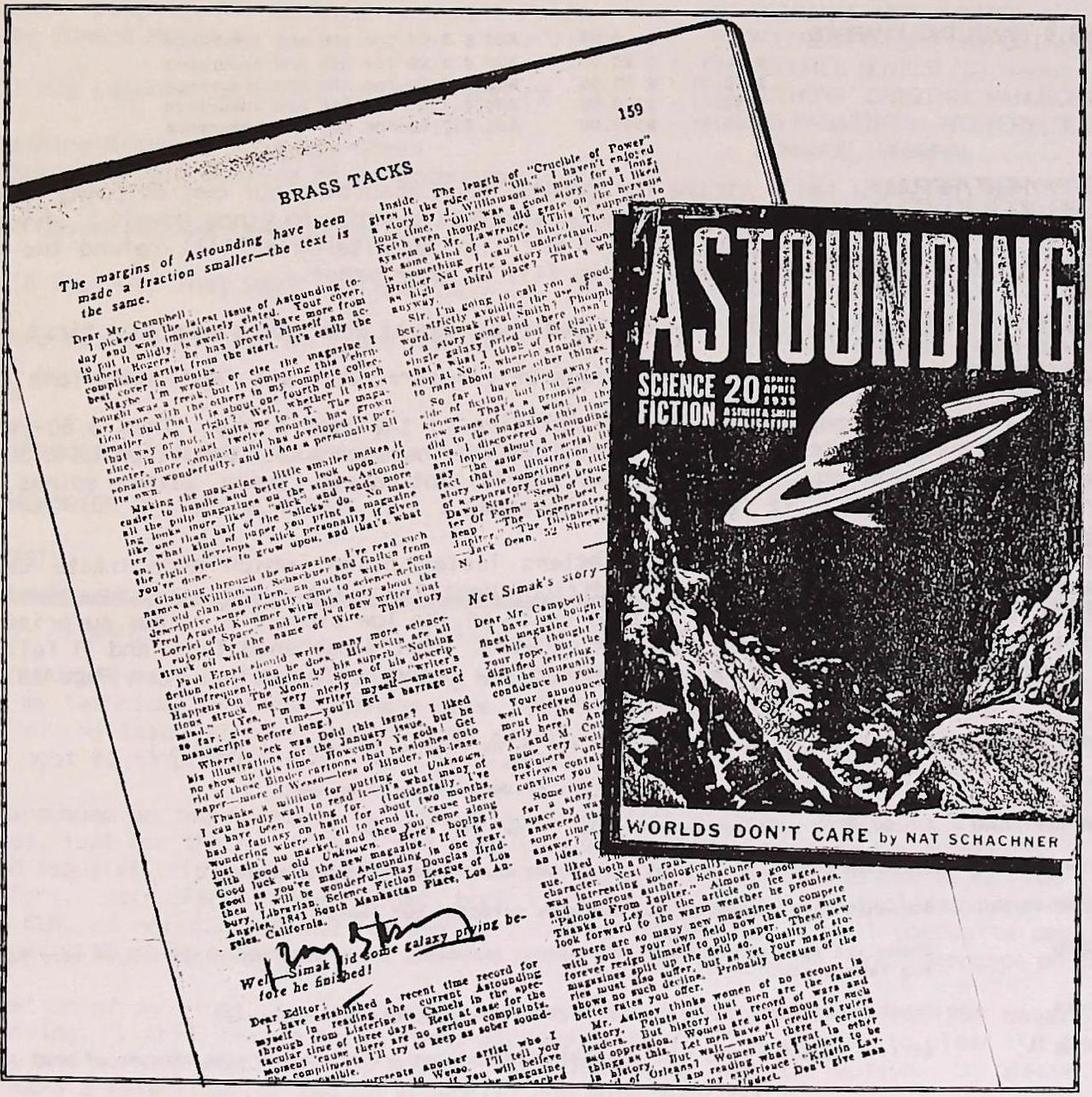
The WORDSMITH

2nd Printing/REVISED

Eclectic COLLECTOR

Issue No. 4

Special Issue Honoring RAY BRADBURY



159

BRASS TACKS

The margins of Astounding have been made a fraction smaller—the text is the same.

Dear Mr. Campbell:

I picked up the latest issue of Astounding today and was immediately elated. Your cover, to put it mildly, is swell. Let's have more from Hubert Rogers; he has proved himself an accomplished artist from the start. It's easily the best cover in months.

Maybe I'm wrong, or else the magazine I bought was a freak, but in comparing this February issue with the others in my complete collection I find that it is about one fourth of an inch smaller. Am I right? Well, whether it stays that way or not, it suits me to a T. The magazine, in the past twelve months, has grown neater, more compact, and has developed its personality wonderfully, and it has a personality all its own.

Making the magazine a little smaller makes it easier to handle and better to look upon. Of all the pulp magazines on the stands, Astounding looks more like a "slick" and reads more like one than half of the "slicks" do. No matter what kind of paper you print a magazine on, it still develops a slick personality if given the right stories to grow upon, and that's what you've done.

Glancing through the magazine, I've read such names as Williamson, Schachner and Gallun from the old clan, and then, an author with a good descriptive sense recently came to science fiction, Fred Arnold Kummer with his story about the "Lorelei of Space," and here is a new writer that I enjoyed by the name of Wire. This story struck oil with me.

Paul Ernst should write many more science-fiction stories than he does. His visits are all too infrequent, judging by his superb "Nothing Happens On The Moon." Some of his descriptions struck me very nicely in my "writer's mind." (Yes, I'm a writer myself—amateur, so far; give me time—you'll get a barrage of manuscripts before long.)

Where in 'eck was Dold this issue? I liked his illustrations for the January issue, but he no show up this time. Howcum? Ye gods! Get rid of those Binder cartoons that he sloshes onto paper—more of Wesso—less of Binder, pab-lease.

Thanks a million for putting out Unknown. I can hardly wait to read it—it's what many of us have been waiting for. (Incidentally, I've had a fantasy on hand for about two months, wondering where in 'ell to send it, 'cause there just ain't no market, and then you come along with good old Unknown. Here's hoping!)

Good luck with the new magazine. If it is as good as you've made Astounding in one year, then it will be wonderful—Ray Douglas Bradbury, Librarian, Science Fiction League of Los Angeles, 1841 South Manhattan Place, Los Angeles, California.

Well—Simak did some galaxy prying before he finished!

Dear Editor:

I have established a recent time record for myself in reading the current Astounding through from Listerine to Camels in the spectacular time of three days. Rest at ease for the moment 'cause there are no serious complaints. The compliments I'll try to keep as sober sound-

ASTOUNDING SCIENCE FICTION 20 CENTS APRIL 1939 A STREET & SMITH PUBLICATION

WORLDS DON'T CARE by NAT SCHACHNER

~~April-May 1997~~ SUMMER 1997

$2.00

Book Reviews • Articles • Fiction • Trade/Sale Offerings

Visit the WORDSMITH/COLLECTOR website — http://members.aol.com/stfwriter/index.html

WORDSMITH / COLLECTOR BUSINESS DATA

ORDERING & SHIPPING: There is only one copy of most items, so everything is first-come-first-served. I will take *reservations* by mail, phone fax, or e-mail (see below), and hold the item(s) up to two (2) weeks, shipping when your check or M.O. arrives. Please list alternate selections. SF&F magazines are bagged. These items are "treasures" to me, and are packaged carefully to preserve them. (I am not responsible for what transporters do, of course.) For your benefit and mine, *every shipment is insured.* Insurance is included in the cost of handling and shipping (below). Inquiries and alternative bids are always welcome. Call/fax (805) 583 - 1300 (fax best); e-mail: Vince-Wordsmith@juno.com (pref) or Stfwriter@aol.com.

SHIPPING & HANDLING CHARGES:

UP TO $ 5.00	Add $ 3.00 for S&H and Insurance
$ 5.01 - $ 20.00	Add $ 4.00 for S&H and Insurance
$ 20.01 - $ 50.00	Add $ 6.00 for S&H and Insurance
$ 50.01 - $100.00	Add $ 7.50 for S&H and Insurance
$100.01 - $200.00	Add $10.00 for S&H and Insurance

TRADING/PAYMENT/REFUNDS: Let's strive for trades, each absorbing our own shipping expenses. If you decide on a "monetary exchange," make checks/MOs payable to Vince Nowell. If you send payment for an item not available, and did not list an alternate, I'll refund the amount (prorated for S&H/Insurance) with what I can fill of your order.

IF YOU PAID FOR THIS ISSUE you will be credited that amount when you place your first order.

SPECIAL LISTS: Page 7 describes separate *Classics Illustrated&Jr* and *"Hollywood-iana"* lists.

CONDITION: I describe condition partially relative to the item's age. Thus a 60-year old *Amazing Stories* rated "VERY GOOD" or VG may not be in the same exact condition as a 30-year-old *Analog* with that rating. If there is any significant damage (tears, broken spines, missing covers or pages, etc.), it is described herein.

For magazines I use the condition identifiers listed below, which approximate dealers' "standardized" codes. However, dealer condition identifiers are subjective, so actual conditions can vary widely. My approach is to grade on the low side; I'd rather surprise someone with a copy in better condition than anticipated. That's happened to me and it felt good, so I'm trying to pass it on. *NOTE: PBs and HCs are coded differently. (See Page 18.)*

VERY FINE/MINT	Never read or used. (Used *only* for works from my personal collection.)
FINE	Virtually like new, minimum IF ANY evidence of wear or use.
NEAR-FINE/NF	Evidence of wear but not serious; "Fine" for its age.
VERY GOOD/VG	Expected condition for its age; shows usage; no serious problems.
NEAR-VG/NVG	Somewhat more wear than VG; has some defects, but looks OK.
GOOD	Shows its age; worn; may have fraying, chipping, tape, some staining, and/or marring from [illegible]ing label, etc.
FAIR	Rough condition, tattered; NOT PRETTY, but complete and readable.
POOR	Still a readable copy with careful handling; well worth preserving because of what it is.

EXCEPTIONS may include missing cover(s) or page(s) (but no issues are missing any pages that critically impact story contents), as well as marks, stains/soiling, tape, creases, etc., that mainly affect appearance but are separate from the overall condition of the magazine, described where applicable. *NOTE:* ~~Strikeout listings~~ = SOLD.

The WORDSMITH Eclectic COLLECTOR
P.O. Box 1258, Simi Valley, CA 93062-1258
Telephone (& 24-hr fax): (805) 583 - 1300

ISSUE NO. 4 - A Magazine Featuring Publications for Trade or Sale

■ CONTENTS ■

FEATURES & ARTICLES

Them All-Singing, All-Dancing Cinematic Pulps by Edward McManus. 12

Call Him Legend—Pseudonyms of Ray Bradbury. 13

Something Bradbury This Way Comes Special Photo Feature of an Encounter. . 16

New "Golden Apples" (Bradbury Book Reviews) 17

How'd They Get That Way? (Collecting). . . .20

Anthro-Science-Fiction by Vince Nowell . . .27

FICTION

The Pequot & the Puritan by Juana FitzPaul. 15

PHOTO MEMORIES OF 1954 WORLDCON. . . . Back Cover

WANT LISTS: 26

TRADE / SALE OFFERINGS:

SF&F / HORROR MAGAZINES. 4
SF ORIGINAL ANTHOLOGIES. 11
MAGAZINES FOR UFO ENTHUSIASTS. . .11
ACE DOUBLE NOVELS (Closeout) . . .12
SF AUTHORS' ORIGINAL MANUSCRIPTS .12
OTHER MAGAZINES: MYSTERY, LITERARY, ROMANCE, GENERAL. 13

PAPERBACK & HARD-COVER BOOK OFFERINGS:

SF&F/HORROR PAPERBACKS 18
SF&F/HORROR HARD-COVER BOOKS . . .19
STRANGE & UNKNOWN-NON-FICT PB. . .20
STRANGE & UNKNOWN-NON-FICT HC. . .21
THE MYSTERY GENRE - PAPERBACKS . .21
THE MYSTERY GENRE - HC BOOKS . . .22
ANTIQUARIAN & RARE HC BOOKS. . . .22
VINTAGE PAPERBACKS (20> YRS) . . .23
GEN-INTEREST PBs - FICTION/NF. . .24
GEN-INTEREST HC BOOKS-FICT/NF. . .25

SPECIAL OFFER FOR TRUE HISTORY BUFFS.22

An Editorial - of Sorts

MORE CHANGES have been made, starting with the name of this publication; it now better reflects my technical writing business name, WORDSMITH. (The Post Office agrees.) And, it *is* eclectic! My Issue #3 cover is the back cover because (1) it's appropriate for this issue, (2) it cost $$ to produce and I want more mileage from it, and (3) I LIKE IT!

I've succumbed on two fronts. 1st, the urge to publish a 'zine, the first since my two 1953 debacles, just for the fun of it. The inspiration came after meeting Ray Bradbury. I hadn't planned Issue #4 this soon, but necessary changes due to the good response to #3 made it worth the effort. More SF&F has been added, book lists pared, want lists included, and additional PRICES CUT, as noted. The 2nd "cave-in": I can be reached via e-mail (opposite page). I'm "on-line" with great trepidation; I see too much illiteracy, idiocy, and ignorance on the Net.

Restoration of my "lost" collection (selective 1923-1961 + certain post-1961 magazines) is progressing. I still have a major space-storage problem. I'm anxious to clear out these duplicate and excised magazines and books to accommodate my REAL collection. So please: take a look, make a selection (or two or several), and send an offer.

Vince - VINCE NOWELL

Cover: 18-year-old Ray Bradbury's letter to Editor John W. Campbell, Jr., *Astounding*, April 1939, now signed.

Contents ©1997 by WORDSMITH. Editor: Vince Nowell. Bradbury photos: W. L. Sisson; BkCov as noted.
THANKS CONTRIBUTORS! PMTs:R&D Photographic,Simi Valley. Production: St.Dominic Press,Simi Valley.

ED MCMANUS' ENCOURAGEMENT: "DON'T LAUGH TOO HARD! REMEMBER, GERNSBACK STARTED OUT WITH CATALOGS."

SECTION I. SCIENCE FICTION & FANTASY / HORROR MAGAZINES

YEAR AND ISSUE		WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
ABORIGINAL SCIENCE FICTION "First all-slick/-color" SF magazine.] *All 7 below: $23; w/Annual: $25.50.*					
1978	Annual	No.1	NEAR-FINE+ First anthology issue	12 stories from first 7 years	$ 5.00
1989	July-August	16	FINE	Soviet humor: Kir Bulychev	$ 3.00
	Sept-October	17	VERY-FINE/MINT	"Premiere Newsstand Issue" [sic]	$ 4.00
1990	July-August	22	MINT (Opened mailing wrapper once)	Mike Resnick, Robert Metzger	$ 4.00
	Nov-December	24	MINT (Opened mailing wrapper once)	Robert Metzger, Lynn Hightower	$ 4.00
1991	Jan-February	25	VERY-FINE/MINT	Robert Metzger	$ 4.00
	March-April	26	VERY-FINE/MINT	Terry McGarry, Ann Schwader	$ 4.00
	May-June	27	MINT (Opened mailing wrapper once)	**HARLAN ELLISON**, Frederik Pohl	$ 5.00
ABSOLUTE MAGNITUDE – *The Magazine of Science Fiction Adventures* [First 2 issues: *HARSH MISTRESS*, renumbered "No.1" with 3rd issue = 1st issue *Absolute Magnitude*.]					
1994	Fall-Winter	No.1	VERY-FINE (Four-color cover)	Hal Clement, Roger Zelazny	$ 4.75
AMAZING STORIES [Venerable Grandfather of U.S. scientifiction, died in 1995 at age 69 years!]					
1928	June	27	GOOD but spine damaged; Bedsheet; definitely a collectible!REDUCED$	H.G.Wells, David H.Keller, Gernsback art, letter: 97-yr-old reader (fascinating)	$15.00
1930	August	53	FAIR overall/Canon color FC & BC; bedsheet; nice reading copy	E.E.Smith, Hamilton, Meek, Fletcher Pratt, return of Frank R. Paul as illustrator	$ 8.00
~~1940~~	~~August~~	~~152~~	~~FINE~~	~~Ralph Milne Farley, Edmond Hamilton~~	~~$10.00~~
1947	January	210	GOOD	Richard S. Shaver	$ 3.50
1950	January	246	FINE 1st issue-Howard Browne, Editor	Richard S. Shaver	$ 5.00
	April	249	FINE	Robert Moore Williams	$ 4.50
1959	June	353?	GOOD/N-VG Digest size	Anderson, Garrett, Rog Phillips	$ 3.00
1985	March	521	FINE+ Digest size GONE	Robert Silverberg, Thomas A. Disch	$ 3.00
1994	Fall	591	VERY-FINE/Practically Mint	Ursula K.LeGuin, M.Resnick, Silverberg	$ 3.00
ANALOG SCIENCE FICTION ("Science Fact/Fiction"/etc.) [Whole No. starts 1930; *Analog* No.: subtract 358.]					
1963	May	390	NEAR-FINE "bedsheet" slick	Bova, Schmitz, M.Reynolds, Tubb, Spinrad	$ 6.00
	June	391	N-VG but marked cover; bedsheet slick	McIntosh, Anderson, Schmitz	$ 5.00
	July	392	NEAR-FINE except marked cover; bedsheet	"Old-timers": Clifford D.Simak, Kris Neville, Harry Harrison	$ 5.00
	August	393	VERY GOOD but 1st ad page gone;bedsheet	Arthur Porges, Leinster, Harrison	$ 5.00
1964	September	406	FINE bedsheet slick	Randall Garrett, Schmitz, Piers Anthony	$ 8.50
	December	409	VERY GOOD bedsheet slick	Leinster, Harrison, M.Reynolds, Spinrad	$ 5.00
1977	November	564	NEAR-FINE digest size (from here one)	Spider Robinson, O.S.Card, M.Reynolds	$ 3.00
1981	November 9th	613?	N-VG but some BC damage	G.Harry Stine	$ 1.50
1982	Mid-Sept	624?	VERY-FINE	L.Sprague de Camp, Jerry Pournelle	$ 3.00
1985	October	663?	FINE	Stanley Schmidt-Editor	$ 3.00
1986	January	667?	FINE	Frederik Pohl	$ 3.00
1992	Mid-December	761?	VERY GOOD slight FC damage		$ 2.00
1994	Mid-December	791?	VERY-FINE/Practically Mint	Charles L. Harness	$ 2.50
1996	February	806?	NEAR-FINE read once (carefully)		$ 2.00
ASIMOV'S SCIENCE FICTION [aka *ISAAC ASIMOV'S SCIENCE FICTION MAGAZINE*]					
1994	Mid-December	225	FINE/Virtually MINT (I.A.'s S.F. Mag.)	Editor: Gardner Dozois (A Dell/Bantam/ Doubleday companion to *Analog SF*	$ 2.00
1996	March	241	NEAR-FINE read only one time		$ 2.00
ASIMOV'S SF ADVENTURE MAGAZINE [Not same as above, tho' George Scithers first edited both.]					
1979	Fall	No. 4	VIRTUALLY MINT! This was final issue.	John Brunner, Isaac Asimov	$ 4.00
ASTOUNDING STORIES/ASTOUNDING SCIENCE FICTION [Whole No. starts 1930; ASF no. subtract 87.] *The venerable Rolls Royce of science fiction magazines for many generations, in all its variously titled incarnations, began with the January 1930 issue.* ASTOUNDING *really began its ascent to glory when John W. Campbell, Jr. took the helm in October 1937. (A "trimmed pulp" of 6½ X 9½ since May 1936.)*					
1937	October	83	GOOD- BC/sp loose; low.left FC loose; general wear but very readable! John W. Campbell's editorial debut	Don A.Stuart (=Campbell), E.E.Smith, Manly Wade Wellman; articles: DeWitt Miller; John W. Campbell, Jr.	$ 5.00
	November	84	NVG some creasing, sm.tear FC	E.E.Smith; Burks; Binder; ltrs:Campbell	$10.00
1938	February	87	Last issue as "...Stories": POOR- FC torn, pcs.miss., holes; COMPLETE	Eando Binder writing as Gordon A.Giles, Smith, Arthur J.Burks, Nat Schachner	$ 2.50
~~1939~~	~~January~~	~~98~~	~~NEAR-FINE~~	~~L.S.deCamp, Jameson, Wellman; 1st SF CON~~	~~$14.00~~
FEATURED ON COVER OF THIS ISSUE:					
~~1939~~	~~April~~	~~101~~	~~N-VG Wonderful collectible due to ltrs. and...an AUTOGRAPHED COPY!!!!!~~	~~Williamson, Simak, Jameson, Binder; letters: deCamp, Asimov, and "amateur writer" RAY DOUGLAS BRADBURY (SIGNED ON LTR-PAGE)!!!~~	~~$25.00~~

YEAR AND ISSUE		WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1940	November	120	GOOD- sp bottom/covers have tears,sm. miss.pieces; pages are NVG cond.	L.RON HUBBARD (writing as René Layfayette); Simak; art: Willy Ley	$12.50
1941	September	130	N-VG for its age; sm.hole BC & sp.top; slightly chewed outside edge FC	DEBUT: RAYMOND F. JONES; HEINLEIN; ASIMOV's "NIGHTFALL"; art: de Camp, JWC,Jr.	$13.50
1942	May	138	NVG Only slight H_2O stain prevents a rating of VG for this bedsheet	HEINLEIN (A.MacDonald) + R.A.H. bk review; ASIMOV's "FOUNDATION";ltrs:Ley,de Camp	$14.00
1943	September	154	NVG- Chewed lo.rt.corner FC;bottom sp. damage; BC slightly loose	RARE (ONLY?) APPEARANCE OF RAY BRADBURY IN *ASTOUNDING*, sh.story AND sh-sh.story; and Anthony Boucher writing as H.H. Holmes	$13.00
1946	September	190	NEAR-FINE digest size; a prime find!	Raymond F.Jones' "The Toymaker," Asimov, Dalton Edwards' classic "Meihem in Ce Klasrum," G.O.Smith; Dr.R.S.Richardson	$ 9.00
1949	November	228	N-VG except some damage to spine;digest	**HEINLEIN**, Sturgeon, van Vogt, Lester del Rey, Isaac Asimov	$ 4.00
1953	February	267	N-VG digest	**WALTER M.MILLER,JR.**, H.Beam Piper,Nourse	$ 2.00
1956	May	306	NEAR-FINE digest	Robt.Silverberg, R.F.Jones, Asimov	$ 3.00
CEMETERY DANCE [Joe Lansdale, Contrib.Ed./8½x11 slick, perf.bind, full-color cover, WT-type.]					
1991	Summer	No. 9	NEAR-FINE tiny crease low-rt corner FC	Bill Pronzini	$ 3.00
1994	Summer	No.21	MINT CONDITION	M.J.Costello, Norman Partridge, M.Shea	$ 4.00
COMET – STORIES OF SUPER TIME AND SPACE [F.Orlin Tremaine, Ed, comeback try after *Astounding*.]					
1941	January	V.1/#2	FAIR-POOR getting brittle, but readable with careful handling; collectible item because of scarcity & contents	Sam Moskowitz, Binder, Harl Vincent, Frank Belknap Long, R.R.Winterbotham, sh-sh Robt. W.Lowndes; ltrs: Isaac Asimov, Jules Unger, James Taurasi, Robt.W."Doc" Lowndes	$ 8.50
DESTINIES – *The Paperback Magazine of Science Fiction and Speculative Fact* CLOSEOUT! ELIMINATING THIS FROM MY COLLECTION Gone *One of 70s ambitious endeavors to "upgrade" SF by issuing pb-size anthology "magazines." Ace Books Div. of Charter Communications, Grosset & Dunlap. Editor: James Baen, former* Galaxy *ed. for UPD (1974). Typ:314>pp.*					
1978	Nov-Dec	V.1/#1	VERY-FINE/MINT	Anderson, Niven, Simak	$ 4.00
	Nov-Dec	V.1/#1	FINE nearly mint	~~Anderson, Niven,~~ Simak	$ 3.00
1979	Aug-Sept	V.1/#4	FINE/VIRTUALLY MINT	O.S.Card, Frank Herbert, Saberhagen	$ 3.00
1980	Feb-Mar	V.2/#1	FINE/VIRTUALLY MINT Issue No.6	Dickson, Pohl, Pournelle	$ 3.00
	Feb-Mar	V.2/#1	FINE Issue No.6	Dickson, Pohl, Pournelle	$ 2.50
	Spring	V.2/#2	FINE Issue No.7	**ROBERT A.HEINLEIN**, James Gunn, Pohl	$ 3.00
	Summer	V.2/#3	VG+ Issue No.8	**ROBERT A.HEINLEIN**, Pohl, Niven	$ 3.00
FAMOUS FANTASTIC MYSTERIES [Wonderful reprint mag; only have two duplicates – both are great!]					
1947	December	49	N-VG - Very collectible due to Doyle	ARTHUR CONAN DOYLE's WWI aviation fantasy, "The Horror of the Heights"	$ 8.00
1948	February	50	SOLID VG! Virgil Finlay FC	Derleth, S.F.Wright;ltrs:Moskowitz,Oliver	$ 6.00
FANTASTIC [aka *-Science Fiction/-Stories of Imagination/-Science Fiction & Fantasy Stories*] *Ziff Davis/Editor Howard Browne got this off to the most successful start of any modern SF&F magazine (Summer 1952), quickly switching from quarterly to bimonthly, and monthly within two years. This sophisticated digest, companion to* Amazing Stories, *hastened the demise of pulp* Fantastic Adventures, *and led to* Amazing *going to digest. It began as a fantasy/macabre/horror mag, but subsequent editors claimed, variously, that SF sold better, or that there was a distinct market for fantasy, and so on. These viewpoints were reflected not only in contents changes, but also in repeated title changes as* Fantastic *sought its identity. After the first two years its uniqueness as a fantasy vehicle wore off. After the mid-1950s it became more of an avant-garde publication in the "speculative fiction" field before being absorbed by* Amazing Stories. *However, during its toddling years it probably came the closest of any publication since 1943 to being another* Unknown Worlds.					
1955	October	?	N-VG	Readers bitch mag too much like *Amazing*; Garson, Fairman, Grant, Butler	$ 1.75
1959	February	?	NEAR-FINE	Editorial change back to emphasis on fantasy; Wyndham, Fairman, Rog Phillips	$ 2.00
1960	December	?	GOOD fully intact, complete	Porges, Galouye, Poul Anderson	$ 1.50
1961	February	?	GOOD++	Keith Laumer, Arthur Porges	$ 1.50
1971	August	?	FINE Editor: Ted White, an old "fapa" partner of mine from 1954	Anderson, Rocklynne, L.Sprague de Camp, debate ensues about meaning of SF	$ 2.00
1972	June	169	FINE	Malzburg, Eklund, Dennis O'Neil of *Green Lantern Comics* fame	$ 2.00
	October	173	VERY-FINE (debates rage re modern SF&F)	Avram Davidson, Fritz Leiber, de Camp	$ 2.00

FANTASTIC ADVENTURES [Pulp companion to *Amazing Stories* 1939–1953; merged into *Fantastic*.]

A Palmer ("RAP") creation, one of the greatest fan-oriented mags in SF's "Golden Age." Carried "lighter" material than Amazing, and had a sense of humor. It was an early casualty of transition from pulps to digests.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1942 August	18?	VG very collectible, 244pp-size	ROBERT BLOCH "Lefty Feep" story, Hamilton, E.F. Russell, August Derleth, R.M.Williams	$ 9.00
1943 January	23?	VG very collectible, 244pp-size	ROBERT BLOCH "Lefty Feep" story, Wilcox, Dwight V. Swain	$ 9.00
1947 December	66?	N-VG a "keeper," 180pp-size	Swain, Geoff St.Reynard (pseud.?); RAP is Ed, but Wm.Hamling Assoc.Ed.	$ 4.50
~~1948 December~~	~~78?~~	~~FINE very collectible!~~	~~Richard S. Shaver, Chester Grier, and "Lee Francis" (=Howard Browne, future Ed.)~~	~~$ 5.00~~
1949 ~~January~~	~~79?~~	~~FINE very collectible! 10th Anniversary~~	~~Grier: *The Return of Sinbad* compl't novel~~	~~$ 5.00~~
available: November	89?	GOOD	Palmer's next-to-last issue as Ed.	$ 3.00
~~1950 June~~	~~98?~~	~~FINE very collectible! H.Browne now Ed.~~	~~A "Toffee" novel by Myers, Mack Reynolds, ltr: from 14-yr-old Bob Silverberg~~	~~$ 5.00~~
1951 August	110?	N-VG	William Tenn, Sturgeon, Fairman (future Ed.), ltr: from now 15-yr-old Bob Silverberg	$ 2.50
~~December~~	~~114?~~	~~NEAR FINE~~	~~Fairman, Williams; ltr: Terry Carr~~	~~$ 3.75~~
~~1952 January~~	~~115?~~	~~NEAR-FINE~~	~~Ivar Jorgenson, Fairman; ltr: Terry Carr~~	~~$ 3.75~~
February	116?	NBC, otherwise contents GOOD & complete	Grier, Fairman, Jorgenson, ~~Milton Lesser~~	$ 1.00
April	118?	FINE a "keeper"	Rog Phillips, ~~Paul W.Fairman~~	$ 4.50
~~June~~	~~120?~~	~~NBC, otherwise contents GOOD & complete~~	~~Don Wilcox, Lesser, Fairman, Stephen Marlowe (= Milton Lesser)~~	~~$ 1.00~~
July	121?	FINE very collectible!	JOHN JAKES "And the Monsters Walk," Sam Merwin, Jr. "One Guitar"	$ 4.50
August	122?	NEAR-FINE a "keeper"	Phillips, Lesser, Wilcox	$ 3.50
~~November~~	~~125?~~	~~NEAR-FINE a "keeper" 5th-from-last issue~~	~~McGivern, Morrison, Stewart~~	~~$ 3.50~~

ALL GONE

GONE

FUTURE .. [aka – *Combined with Science Fiction Stories* / – *Science Fiction Stories* / – *Science Fiction*]

Columbia Publications had trouble deciding what to name this post-WWII revival in its decade of existence. It ended as a digest, but is better remembered as a pulp. The volume/no. count began with V.1/#1 with May-June 1950 premiere revival issue. Whole No. here refers to 1939 beginning; postwar no.: subtract 17.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1951 July	25	NEAR-FINE would be FINE except for some slight sp damage; Post-war #8	G.O.Smith, decamp, Lester del Rey, C.Dye, N.Loomis; ltr: James Blish on Dianetics	$ 4.00
1952 July	31	FINE Ed.Robt.W.Lowndes: one of the best treatises ever on "what *is* science fiction?"; Post-war #14	Charles Dye novel, Wallace West, Lester del Rey, Jerome Bixby, ltr: from Judith Merril	$ 5.00
1953 January	34	GOOD *but* NBC, some spine damage; very readable copy!; Post-war #17	John Wyndham, James Blish, H.B.Fyfe, Damon Knight	$ 1.75
~~March~~	~~35~~	~~NEAR FINE would be FINE except for small corner missing from back cover; Post war #18~~	~~Simak, Anderson, Merril & "James MacCreigh" (=Frederik Pohl), Raymond F. Jones "The Moon is Death" (see orig.ms offer p.10)~~	~~$ 4.00~~

GALAXY SCIENCE FICTION . . . MAGAZINE

The very late H(orace) L. Gold's idea of the perfectly balanced SF magazine, this quickly became a "literary leader" from 1950-1960. In Spring 1959 Galaxy *acquired James L. Quinn's* IF*, then merged the two in Spring 1975. Gold left in 1961 to be followed by the very capable Frederik Pohl (until 1968), then Lester del Rey, until* Galaxy *was sold to UPD (1969), with Eljar Jakobsson as Editor, followed by James Baen (1974), then John J. Pierce. Through the years the "associate editor" roster was impressive: Groff Conklin (book reviews), Willy Ley (Science Editor), Sam Merwin, Jr., Damon Knight, Frederik Pohl, Theodore Sturgeon, Lester del Rey and Judy-Lynn Benjamin-del Rey, James Baen, and Jerry Pournelle.* THIS WAS MY ALL-TIME FAVORITE MAGAZINE IN THE 1950s!

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
~~1950 October~~	~~Vol.1 No.1~~	~~FAIR-GOOD Covers loose, bottom FC tattered, some H_2O stain, ink marks; rough but readable & COLLECTIBLE!~~	~~Simak's *Time Quarry* (pt.1), Sturgeon, MacLean, Matheson's *Third From the Sun*, Leiber, Asimov, Brown, Willy Ley (misspelled on cover)~~	~~$ 4.75~~
1951 March	No.6	NEAR-FINE a great collectible	Simak, Leinster, Asimov, Ley, and a story anticipating *Star Trek*'s "transporters," by 12 years: LESTER DEL REY's "The Wind Between the Worlds"	$ 4.00
1953 February	29	NEAR-FINE a "keeper"	Sheckley, Knight, Sturgeon, Simak, Budrys	$ 3.50
1954 November	50	NEAR-FINE a "keeper"	Sheckley, Simak, Willy Ley	$ 3.00
1956 March	65	GOOD by spine damaged/contents OK	Pohl, deCamp, Gunn, Gordon R.Dickson, Ley	$ 1.50
1976 December	231	N-VG but taped spine	Pournelle, Pohl, Robinson	$ 1.25
1977 March	234	N-VG but taped spine; mail label	Eklund, Pournelle, Robinson, Irwin	$ 1.00
April	235	VERY GOOD but taped spine; mail label	Greg Bear, Robinson, Pournelle	$ 1.25
May	236	GOOD but FC damage, taped spine; mail label	F.Herbert, S.Robinson, Richard Geis long-time fan, contributor to my fanzine 1953	$ .75
1978 September	252	NEAR-FINE (published by UPD)	Pierce, Editor; Pournelle, Science Editor	$ 1.50

GALAXY [The "Revival"]

A strange magazine out of California's "Gold Rush Country," Nevada City, in the high Sierras, edited by E.J. Gold, daddy H.L.'s son. Published by not-for-profit Institute for Development of the Harmonious Human Being, Inc. [sic], and carrying advertising for very expensive SF&F limited-edition books and audio tapes, as well as southwestern-style modern artwork. Resurrected in January 1994 as 8½ X 11, perfect-bound, dull stock "bed-sheet," carrying a few reprints from old Galaxy, and new speculative fiction and features. Not my cup of tea!

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1994 Sept-October	No.5	VERY-FINE/Virtually MINT	Poul & Karen Anderson, Barry Malzburg, Gordon R.Dickson, Evelyn E. Smith	$ 4.00

~~GOLDEN FLEECE – Historical Adventure~~

GONE

Having earned my college ~~degrees~~ in history, this is one of my all-time ~~favorites.~~ Inadvertently acquired duplicate issue (and still need two others ~~to complete my~~ collection).

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1938 December	~~No.3~~	~~NEAR-FINE~~ tiny piece missing, top-left ~~corner of FC~~	Frederic Arnold ~~Kummer, Jr.~~, Anthony M.Rud, ~~ltrs reflect antithesis of SF fans~~	~~$25.00~~

GREAT SCIENCE FICTION [aka SCIENCE FICTION GREATS] – Ultimate Pub.Co. repr Ziff Davis mags.]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1966 Spring	No. 2	NEAR-FINE reprints from *Fantastic*	ROBERT BLOCH, HARLAN ELLISON	$ 3.50
~~1967 Fall~~	~~No. 8~~	~~GOOD FC stained, otherwise overall Good~~	~~JACK VANCE, John Jakes~~	~~$ 2.00~~
1969 Summer	No.15	GOOD (now *Science Fiction Greats*)	Arthur C.Clarke, John Brunner, Jakes	$ 1.75

THE HAUNT OF HORROR – Tales of Terror and the Macabre [Stan Lee/Marvel Mag.Group–NOT A COMIC!]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1973 August	No.2	N-VG except for vertical crease down FC KELLY FREAS Cover for O'Neil story "Devil Night"	ELLISON, McCaffrey, Goulart, Lin Carter, Fritz Leiber's Sequel to "Conjure Wife," Dennis O'Neil (*Green Lantern* fame)	$ 5.00

IMAGINATION – Stories of Science and Fantasy

William L. Hamling's magazine after leaving Ziff Davis, acquired from Ray Palmer. Never one of the "biggies" of SF, but it had a loyal fan following from October 1950 to October 1958.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1951 September	No. 6	N-VG	Swain, Neville, William Campbell Gault	$ 5.00
November	No. 7	N-VG	St.Reynard, decamp, Milton Lesser	$ 5.00
1952 September	No.12	VG	Swain, Knight, Venable, Galouye	$ 5.00
1953 April	17	VG	Richard S. Shaver, St.Reynard, Phillips	$ 4.00
~~1957 December~~	~~58~~	~~POOR NFC; contents/sp complete~~	~~Randall Garrett, Silverberg, E.Hamilton~~	~~$ .50~~

GONE

MAGAZINE OF FANTASY & SCIENCE FICTION, THE [aka FANTASY & SCIENCE FICTION or F&SF]

In my view, this was the classiest magazine ever produced for a consistently "good SF&F read," issue after issue. It shunned Astounding*'s pomposity and* Galaxy*'s self-glorification, turning out first-class SF while often matching the quality of* Unknown*'s fantasy. In that latter genre, it was matched (maybe surpassed) only briefly by the first few issues of* Fantastic*. (This is not to sleight the masterful* Weird Tales*, but WT filled a unique niche in a league of its own.) By the 1980s and after, while* F&SF *still ranked high, it no longer had that "leading edge" quality, having slipped too much into the general and crowded new wave/speculative fiction mold.*

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1953 March	No.22	GOOD-VG small split, bottom of spine; Chesley Bonestell double-cover	Idris Seabright, Anthony Boucher, Manly Wade Wellman, Tucker	$ 3.00
1955 November	No.54	FAIR-GOOD some FC tatter	Cartmill, Asimov, Sturgeon	$ 2.00
1956 March	No.58	FAIR-GOOD sm.tears/chips,stain,FC wear	J.B.PRIESTLY, SAKI, BRADBURY, Chas.Beaumont	$ 4.50
1986 January	416	VG *but FC has mail label*	ELLISON, Asimov, Algis Budrys	$ 2.00
March	418	N-VG " " " " "	James Tiptree, Jr.	$ 1.00
1986 April	419	N-VG " " " " "	Robert F.Young, Damon Knight	$ 1.00
June	421	N-VG " " " " "	John Brunner, Michael Bishop, R.F.Young	$ 1.00
August	423	VG " " " " "	ELLISON, Isaac Asimov	$ 2.00
1987 April	431	N-VG " " " " "	Alan Dean Foster	$ 1.00
June	433	N-VG " " " " "	Porges, Orson Scott Card, R.F.Young	$ 1.00
1988 May	444	N-VG " " " " "	ELLISON, Asimov, Card, Tiptree	$ 2.00
September	448	N-VG " " " " "	BUDRYS' Obit for Heinlein, Marion Zimmer Bradley, Ron Goulart	$ 3.50
December	451	FINE (Contains 1988 Index)	Harry Turtledove	$ 2.75
1989 January	452	FINE	ELLISON, Card, Budrys, Asimov	$ 3.25
April	455	VERY-FINE/MINT	Asimov, A.D.Foster, O.S.Card	$ 3.00
1994 December	528	FINE/Virtually MINT (1994 Index)	RAY BRADBURY (New), ELLISON, ISAAC ASIMOV (Posthumously) & JANET ASIMOV, LeGuin	$ 3.50

MARION ZIMMER BRADLEY'S FANTASY MAGAZINE [Artsy 8½ X 11 Perfect-Bound Slick]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1994 Fall	25	MINT (*Interview w/Ray Nelson, 50s BNF, invented propeller beanie!*)	Darrell Schweitzer, Farke Godwin	$ 4.50

SPECIAL SUPPLEMENTARY LISTS: *Classics Illustrated* and *Classics Illustrated Junior* issues, some VG++ to F, others not so lucky; most are HRNs but some still scarce. HOLLYWOOD-IANA: Motion picture books (the industry and the personalities), movie premier books (large size HCs & SCs), photos, reference-rich magazines, and much more. Contact Vince Nowell @ WORDSMITH/COLLECTOR, P.O. Box 1258, Simi Valley, CA 93062-1258 for free lists of condition and prices.

still avail.

YEAR AND ISSUE — WHOLE NO. — CONDITION, ANY EXCEPTIONS & SIZE NOTES — CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES — MY PRICE

NEW WORLDS – Fiction of the Future / NEW WORLDS SCIENCE FICTION [United Kingdom]

SOLD OUT

formed by British fans in April 1949 out of frustration with having Nova Publications (John Carnell, Editor) was formed by British fans in April 1949 out of frustration with having access only to U.S. reprint SF magazines and low-quality, erratically published U.K. attempts. It was an early endeavor to provide better SF to British readers in non-pulp format. New Worlds *merged in 1966 with its later-founded (1952) companion,* Science-Fantasy.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1950 Spring	No. 6	NEAR-FINE	"Tall digest" size (5½ X 8½)	$ 7.00
1952 July	No.16	NEAR-FINE	" " " "	$ 6.00
September	No.17	NEAR-FINE	" " " "	$ 6.00
1953 January	No.19	FINE	" " " "	$ 6.50
June	No.21	FINE/Virtually MINT (now *New Worlds Science Fiction*) 1st stnd digest-sized issue		$ 7.00
1954 May	No.23	FINE (now published monthly)	A.Bertram Chandler, C.M.Kornbluth	$ 6.50
August	No.26	FINE	Wilson Tucker's "Wild Talent"	$ 6.50
1955 April	No.34	NEAR-FINE to FINE	John Brunner, E.C.Tubb, Kenneth Bulmer	$ 8.00
May	No.35	NEAR-FINE	Judith Merril, John Wyndham, E.C.Tubb	$ 6.00
1956 September	51	FINE	J.T.McIntosh, Brian Aldiss	$ 5.50
December	54	NEAR-FINE	Isaac Asimov, Richard Wilson	$ 5.00
1957 February	56	NEAR-FINE (new cover logo)	J.T.McIntosh	$ 5.00
March	57	FINE	Kenneth Bulmer	$ 5.50
July	61	FINE	Brian Aldiss, Richard Wilson	$ 5.50
September	63	FINE	15th World SF Convention Issue (London)	$ 5.50
December	66	N-VG	John Brunner	$ 4.00
1958 February	68	NEAR-FINE	John Brunner, E.C.Tubb, Kenneth Bulmer	$ 5.00

~~SALES NOTE: *New Worlds* LOT (the 17 issues enumerated above) FOR $ 88.00 (>10% discount)~~
~~*New Worlds* LOT combined with *Science-Fantasy* LOT FOR $103.00 (>12% discount)~~
~~*New Worlds*, *Science-Fantasy* LOTS and *Science Fiction Adventures* FOR $105.00 (>14% discount)~~

OMNI / THE BEST OF OMNI SCIENCE FICTION [Magazine-style anthology, Ben Bova co-Ed.]

1980 Undated	(No.1)	FINE 8½ X 11 slick	HARLAN ELLISON story	$ 7.50

Gone

OTHER WORLDS (aka **OTHER WORLDS SCIENCE STORIES**, *et al*)

It RAP's major work after leaving Ziff Davis' in 1949. Its first incarnation lasted until July 1953 (below). It was reborn in 1955 combined with Universe Science Fiction, *acquired by Palmer from Clark Publishing Co., famous for its* Fate Magazine, *which ironically also was fathered by Ray Palmer (1948).* Other World's *history is a bit cloudy, at best, but around 1957 it "evolved" into something called* Flying Saucers from Other Worlds *(still running a little SF), then went strictly UFO as Palmer left the science fiction field for good.* (Good!)

1950 October	Vol.1 No.2	FAIR-GOOD FC top-rt corn miss, edges & first 3 pp chewed, browning, stain; overall, tho' VERY READABLE! Rare!	Rog Phillips, famous Palmer editorial, short Shaver feature (not by RS), fan news, ltrs incl from future asst.editor Mahaffey	$7.50
1951 September	13	FAIR+/GOOD FC loosening, chew top edge, BC some discolor, stain, browning, past mildewing, chewing. READABLE!	**ROBERT BLOCH**, E.F.Russell, Fredric Brown, Willy Ley art. - rare outside *Astounding* at that time. Good author lineup.	$ 7.50
1953 July	31	VG (Rare magazine)	Lyn Venable, L.Sprague de Camp, Don Wilcox long ltr on SF hist/interesting reply by RAP	$ 3.00

PLANET STORIES [Always funky, but enjoyable as the epitome of old-time space-opera SF.]

1951 November	51	N-VG displays some wear, minor stains	Mary Elizabeth Counselman,all-star issue	$ 6.00

RAY BRADBURY CHRONICLES, THE ["Illustrated adaptations," i.e., "comics" - *but classy.*]

1992 July	No.2	MINT! *Come Into My Cellar; Rocket Summer & The Locusts; A Piece of Wood;* and E.C. Comics classic adaption: *The Flying Machine*, and others; Intro: R.B.		$10.50
November	No.3	MINT! *The Veldt; Gotcha!; Homecoming; The Aqueduct;* and E.C. Comics classic adaptation by Wally Wood: *There Will Come Soft Rains;* Intro: R.B.		$11.50

ROD SERLING'S TWILIGHT ZONE MAGAZINE [Posthumous tribute to the late screenwriter/producer.]

1981 December	No. 9	FINE/Virtually MINT	Intrvw: ELLISON, Gahan Wilson, Sturgeon	$ 5.00
1982 September	18	NEAR-FINE *except* mail label	Sampler of Arthur Machen, Thomas Disch, Rod Serling, Ron Goulart	$ 3.00
October	19	NEAR-FINE *except* mail label	Avram Davidson, Sheckley, Serling, Disch, Goulart; interview with Nicholas Meyer	$ 3.00
1983 July-August	27	MINT	H.P.LOVECRAFT, S.Fowler Wright, G.Wilson	$ 6.00
September-Oct	28	MINT	Will Stanton, Carol Serling, G.Wilson; color preview of *Twilight Zone - The Movie*	$ 4.00

SCIENCE-FANTASY [United Kingdom] {See *New Worlds* for publisher historical data.]

SOLD

1953 Spring	No. 6	NEAR-FINE "Tall digest" (5½X 8½)	J.T.McIntosh, E.C.Tubb, J.F.Burke	$ 6.00
1954 July	No. 9	FINE (Standard digest size)	A.Bertram Chandler,Aldiss,Tubb,McIntosh	$ 7.00
1959 June	35	FINE	Arthur C.Clarke, Fritz Leiber, Aldiss	$ 6.00

SALES NOTE: *Science-Fantasy* LOT (the 3 issues enumerated above) FOR $ 17.00 (>10% discount)

YEAR AND ISSUE — WHOLE NO. — CONDITION, ANY EXCEPTIONS & SIZE NOTES — CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES — MY PRICE

SCIENCE FICTION ADVENTURES [United Kingdom]

Founded 1958 as "action SF" companion to New Worlds *and* Science-Fantasy *by Nova Publications (John Carnell). It initially reprinted stories from Royal Publications (USA)* Science Fiction Adventures, *which began with the late Larry T. Shaw as Editor in December 1956 and ended in June 1958. By January 1959, the UK's SFA dropped U.S. reprints in favor of new British-authored stories. The magazine died with May 1963 issue (#32).*

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1959 May	No. 8	NEAR-FINE [NOTE:Mag began with V.2/#1.]	2 novels:1 by Jay Williams,Clifford Reed	$ 5.00

SALES NOTE: For LOT discount in combination with: *New Worlds* and *Science-Fantasy*, see Page 6.

SCIENCE FICTION AGE [Mix fiction, articles, news, reviews; 8½x11 perfect-bound, full-color slick.]

1994 November	V.3/#1	MINT (May be 13th issue.)	**ELLISON**, John Brunner, Michael Resnick	$ 4.00

SCIENCE FICTION CHRONICLE – The Monthly SF and Fantasy Newsmagazine

Founder/Publisher/Editor Andrew I. Porter's successor (since 1973) to ALGOL *and* STARSHIP.

1994 October	#177	MINT (15th Anniversary Issue as *SFC.*)	Emsh cover;Porter reflects on *SFC*'s hist	$ 3.50

SCIENCE FICTION DIGEST [The Davis Publications "revival," and sister to then-Davis-owned *Analog.*]

1982 May-June	No. 3	VG (Vincent & son V.B.Price on monsters.)	Michael Bishop "No Enemy But Time"	$ 3,75

SCIENCE FICTION QUARTERLY [Columbia Publctns/"the last true pulp SF magazine" - James Gunn]

A 1940s pulp revived after WWII, this mag finally died with the February 1958 issue. Whole no. based on 1940 first issue; for post-war series subtract 10. (Worse yet, vol./# sequence began anew in May 1951.)

1952 August	16	FINE - Very collectible	Alfred Coppel, Phillips, Lesser, L.Sprague de Camp; ltrs: Judith Merril, de Camp	$ 5.00
1954 May	23	NEAR-FINE	Charles Beaumont, Jerome Bixby, Damon Knight; Robt Madle fan/SF news column	$ 4.50

Gone

~~**STAR*REACH** [Mike Friedrich, Editor/Publisher/b/w SF "adult comic" — NOT PORNO.]~~

~~*Published mostly as a labor of love from mid-1975 until October 1979. Earlier issues are increasing in value (per Halley's 1995 edition of Comics Values Annual.) These are the final two issues of this periodical in this format, both FINE, and sold only as a "SET" for $5.00.*~~

~~1979 July~~	~~No.17~~	~~FINE 8½ X 11 3-color cover;~~	~~Edgar Allen Poe's "The Raven" with b/w art by Jeffrey Bonivert~~	
~~October~~	~~No.18~~	~~FINE " comp full color cover~~	~~FC/BC by Lee Marrs; contents: Marrs, Masaichi Mukaide~~	

STAR WARS GALAXY MAGAZINE [News/reviews/features centered around Lucasfilm's *Star Wars.*]

News, reviews, features, memorabilia ads, a comic section from Dark Horse, *and a foldout poster. Published by Topps, 7 X 10½ (approx comic book size), full-color, perfect-bound slick.* ***PREMIERE ISSUE: EXTRA HALF-COVER.***

1994 Fall	No. 1	VF tho', slightly scratched FC from newsstand display.		$ 4.75

STARTLING STORIES – *Scientifiction at Its Best* and *Today's Science Fiction – Tomorrow's Fact*

The infamous "thud and blunder" companion to Thrilling Wonder Stories *(direct heir to Gernsback's 1929 "SF rein- carnation" with his various* Wonder *magazines). It lasted 16 years (99 issues) from January 1939 to October 1955 under such editors as Mortimer Weisinger (a fan hired at age 21 from the first fan club, The Scienceers, New York City), Oscar J. Friend, Sam Merwin, Jr., Samuel Mines, Fanny Ellsworth, and Alexander Samalman.*

~~1951 January~~	~~66~~	~~FINE/Close to MINT~~	~~E.Hamilton "Capt.Future" novelette, Raymond Z.Gallun novel; ltr: Lin Carter~~	~~$ 6.00~~
1952 February	73	FAIR-NBC, contents complt, great read!	M.St.Clair novel,C.Oliver,Fletcher Pratt, Brackett, Ley, Jerome Bixby fan col.	$ 2.00
May	76	N-VG	G.O.Smith, St.Clair, Bixby, Russell	$ 3.00
May	76	GOOD to N-VG	[Duplicate of above.]	$ 2.75
July	78	GOOD	Arthur C. Clarke, Miriam Allen de Ford	$ 2.50
1954 January	92	VG/tape cov edges;now trimmed sm.pulp	**PHILIP K. DICK**, W.Tucker novel, St.Clair	$ 4.25
Fall	95	FINE/Nearly MINT-5th from last issue	G.O.Smith novel, St.Clair, F.L. Wallace	$ 5.00

~~**STEPHEN KING'S CREEPSHOW** [Plume Books/Penguin, 1st Edition Illustrated Adaptation]~~

~~1982 July~~	~~1-Shot~~	~~NEAR-FINE/Close to MINT (Based on Geo.A.Romero's film.)~~	~~Art: Berni & Michele Wrightson, cover by Jack Kamen; 8½ X 11, spine, stiff covers, full-color~~	~~$15.00~~

STRANGE FANTASY [Ultimate Publishing Co. reprint of Ziff Davis magazines.]

1970 Fall	13	FAIR-POOR corner FC missing; first 2pp missg but no critical contents lost	John Brunner, Fritz Leiber, Clifford D. Simak, Ron Goulart, Roger Zelazny	$ 1.25

TEN-STORY (10 STORY) FANTASY [Avon 1-shot ragged-edge pulp, Editor: Donald A. Wollheim.]

1951 Spring	V.1/#1	GOOD+ (some water stain, minor damage lower left FC & cover edges); All-star issue,top writers/ONLY ISSUE!	Arthur C.Clarke's precursor to "2001: Space Odyssey," John Beynon (Wyndham),Derleth,Leiber, van Vogt,del Rey,Kornbluth,de Camp, MORE	$ 8.00

BOOK MALL OF VENTURA: 424 E.Main St.,Ventura,CA 93001 / Ph-(805) 641-BOOK / FAX-(805) 643-4854
Diane L. Neveu — Rare, Collectible and Out-of-Print Books; Searches; Large SF&F Inventory.

THRILLING SCIENCE FICTION [Ultimate Publ. Co., digest reprint of Ziff Davis magazines]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1974 October		FINE/Near-MINT	Bova, Silverberg, Laumer	$ 2.00
December		FINE/Near-MINT	Moskowitz, Fairman, Bova, Banks	$ 2.00

THRILLING WONDER STORIES [The "classier" companion to *Startling Stories.*] – PRICE CUTS!

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1945 Spring		VG - slight roll but bright;Bergey cov	Kuttner,Sam Merwin,Rocklynne,Kummer	$ 6.00
1952 July	BRITISH No.5*	VG - some tape on spine (*No. in UK)	Fletcher Pratt's "Double Jeopardy"	$ 5.50

UNIVERSE SCIENCE FICTION [Fifth issue under editorship of Ray Palmer]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1954 September	No. 7	N-VG	Evan Hunter, Rog Phillips, Alan E.Nourse	$ 2.00

UNKNOWN [aka **UNKNOWN FANTASY FICTION / UNKNOWN WORLDS FANTASY FICTION**]

Any reader/fan/collector is cognizant of this now-rare, highly acclaimed, much-sought-after, and too-short-lived
companion to Astounding Science Fiction. "Born" in March 1939, it lasted only 39 issues to October 1943, when
it fell as one of SF's casualties of WWII paper shortages. This fantasy gem of Street & Smith Publishing Co.
and John W. Campbell, Jr. was often emulated, nearly matched, but never bettered.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1940 June	No. 4*	FINE (*British Edition)	L.Sprague deCamp;Thomas Calvert McClary	$20.00
~~1942 August~~	~~32~~	~~FINE - bedsheet/a real collectible!~~	~~A.Bester;del Rey;Leiber;Sturgeon;v.Vogt~~	~~$30.00~~

UNKNOWN WORLDS OF SCIENCE FICTION [Illust adapt ("comics") of name-authors' stories.]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1975 May	No. 3	NEAR-FINE (Third of six issues.) Very classy magazine!	HARLAN ELLISON "'Repent, Harlequin,' Said the Ticktockman", Niven, Herbert, Shaw	$ 5.00

SOLD

VARGO STATTEN SCIENCE FICTION MAGAZINE [United Kingdom] aka: **VARGO STATTEN BRITISH SCIENCE FICTION MAGAZINE / BRITISH SCIENCE FICTION MAGAZINE / BRITISH SPACE FICTION MAGAZINE**

Vargo Statten Science Fiction Magazine - "New Worlds to Conquer" (subtitle after first issue) was launched by
Scion, Ltd. in January 1954. Editor Alistair Paterson took the mag through several title changes until Scion
collapsed. It was picked up by Scion's printer, Dragon Publications, while John Russell Fearn (who SF histor-
ians say WAS "Vargo Statten") got masthead credit as Editor (November 1954). After 19 irregularly published
issues the mag (as British Space Fiction Magazine) aborted in February 1956 due to a printers' strike.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1954 January	No. 1	NEAR-FINE Same cover art/logo FC & BC	"All-new/all-British" stories by E.C. Tubb, "Vargo Statten," *et al*	$12.00
March	No. 3	NEAR-FINE Same cover art/logo FC & BC	Statten,Tubb;lots of fan news;autoblog Walt Willis of N.Ireland (well-known in US)	$12.00

VARGO STATTEN SCIENCE FICTION MAGAZINE "SET" - Both Issues Above for: $20.00

GONE

VERTEX – The Magazine of Science Fiction

In its inception, this relatively short-lived (1973-75) avant-garde science-fact/science-fiction periodical
somewhat resembled the soon-to-follow OMNI in style and format, and could pass as a precursor to Science Fiction
Age. However, by the third anniversary issue the slick-coated interior paper had been dropped for a semi-news-
print). Near its end, Vertex was published in a sort-of tabloid newspaper format. Overall, an interesting
experiment, and a good example of the ongoing evolution of SF magazine publishing.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1974 June	No. 8	NEAR-FINE - Barely misses "FINE"	HARLAN ELLISON, Ted White, John Brunner, Poul Anderson, Silverberg, Piers Anthony	$ 6.00
1975 February	12	FINE	This issue emphasizes science	$ 5.00
April	13	FINE - Interview with Judy-Lynn del Rey; photo preview of movie *Earthquake*		$ 5.00

WEIRD TALES [Issues from the last three resurrections of this legendary magazine.]

The history of the venerable Weird Tales *is too well known to repeat here. After the original magazine died in September 1954 there followed not one, not two ... but FOUR revivals. The first one below, pb size, is the FIRST ISSUE from Zebra Books, edited by the late Lin Carter. The next one below (#289) is the very scarce (because it was not well distributed) second issue of the two "illegal California WTs," published by Brian Forbes (who autographed the issue available here). The remaining issues below are the Terminus Publishing revival put out by John Betancourt, Darrell Schweitzer, et al. At the end of 1993, with issue No.309 (which I do not have), Terminus' right to the name/logo* Weird Tales *was revoked by the copyright holder, Robert Weinberg. In a telephone conversation with him, he told me that Terminus failed to keep up their royalty payments, and that he didn't mind pulling the name back as he was working on a deal for a WT movie – this in late 1994.*

SALES NOTE: "MINT" means exactly that; I've kept these in unread, pristine storage.

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
~~1981 Spring~~	~~#284~~	~~MINT (Zebra Books printed "No.1" on FC) A "blockbuster" issue! PRICE CUT!~~	~~A NEW Robert E.Howard story, C.A.Smith, Derleth, HANNES BOK, Tanith Lee, intro: Ray Bradbury, Robt.Bloch, Ted Sturgeon, & Sam Moskowitz~~	~~$15.00~~
~~1985 Winter~~	~~#289~~	~~FINE (Signed by Publisher, Brian Forbes) 8½ x 11 "slick" magazine, beautiful artwork on cover; Ed.Mark Monsolo~~	~~ROBERT BLOCH, Stanton A.Coblentz, William F. Temple, A.E.van Vogt, and John Wyndham PRICE CUT!~~	~~$25.00~~
1988 Spring	#290	MINT/AUTOGRAPHED BY GENE WOLF 65th Anniv Iss (7x10 slick)	Gene Wolf Issue, Arthur Lloyd Eshbach, Tanith Lee, Darrell Schweitzer PRICE CUT!	$20.00

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1988 Summer	#291	MINT	Tanith Lee Issue; Harry Turtledove	$10.00
Fall	#292	MINT	Interview with Clive Barker	$ 8.00
1988/89 Winter	#293	MINT	Avram Davidson Issue; Robert Sheckley	$ 8.00
1989 Fall	#294	MINT	Reginald Bretnor	$ 8.00
Winter	#295	MINT	Robert Sheckley	$ 8.00
1990 Spring	#296	MINT	Harry Turtledove	$ 7.00
Summer	#297	MINT Cover & art by Kelly Freas	JOHN BRUNNER	$ 8.00
Fall	#298	MINT	STEPHEN KING, R.Bretnor, Fred Chappell	$10.00
1990/91 Winter	#299	MINT	William F. Nolan	$ 8.00
1991 Spring	#300	MINT	ROBERT BLOCH ISSUE; ROBERT BLOCH-HENRY KUTTNER story, RAY BRADBURY (poem), Gahan Wilson artwork PRICE CUT!!	$20.00
Summer	#301	MINT	ROBERT BLOCH, STEPHEN KING	$18.00
Fall	#302	MINT	WILLIAM F. NOLAN ISSUE; ROBERT BLOCH	$12.00
1991/92 Winter	#303	MINT	Tanith Lee	$ 7.00
1992 Spring	#304	MINT	JOHN BRUNNER ISSUE; Tanith Lee PRICE CUT!	$ 9.00
1993 Spring	#306	MINT (Went to 8½x11 w/#305 issue)	Nina Kiriki Hoffman Issue; Lord Dunsany, Tanith Lee	$ 7.00
Summer	#307	MINT	Ian Watson Issue; John Brunner	$ 7.00

GONE

SALES NOTE—PRICE CUT!!: All 19 *WEIRD TALES* issues above can be purchased as a LOT FOR ~~$200.00~~ $185.00!

WONDER STORY ANNUAL [Standard Magazines, not Lualdi's revived *Wonder Stories* in 1957 & 1963.]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
1953 February	No. 4 EMSH Cover Ed:S.Mines	N-VG - crease up.rt FC, slight roll, some wrinkling, BUT pages are bright and clean (N-F)	ROBERT A. HEINLEIN's "Jerry is a Man", RAY BRADBURY, Williamson, Kuttner, Asimov, Oliver Saari, Zagat, Brown, Samuel Mines	$ 7.50

WORLDS OF TOMORROW [Galaxy Publishing Co., Frederik Pohl, Editor]

YEAR AND ISSUE	WHOLE NO.	CONDITION, ANY EXCEPTIONS & SIZE NOTES	CONTENTS/AUTHORS/SPECIAL-INTEREST NOTES	MY PRICE
~~1963 April~~	~~V.1/#1~~	~~VG~~	~~Clarke, Leinster, Leiber~~	~~$ 5.00~~
1964 November	10	N-VG	A.Bertram and Susan Chandler	$ 3.00
1965 March	12	NEAR-FINE	Brian Aldiss, Larry Niven, Ron Goulart	$ 3.50

AVAIL.:

SECTION II. SCIENCE FICTION ORIGINAL ANTHOLOGIES ("MAGAZINES" IN PB FORMAT)

SALES NOTE: *Also see* Destinies *(closeout) listed on Page 5.*

CONTINUUM [Berkley – Roger Elwood, Editor/4 vol: 1974–1975 Complete Set (Underlined Below) @ $5.25
No.1 GOOD+ (sp.creases) DEAN KOONTZ, GENE WOLF $1 /////// No.1 NVG (minor chips, creases) McCAFFREY, PANGBORN $1.50
No.2 NVG- (scrape up.rt FC) FARMER, CHAD OLIVER $1.25 //// No.3 NVG (small sp.creases) WOLF, SCORTIA, ANDERSON $1.50
No.4 VG (tiny creases) CLIMATIC VOL: BARRY MALZBERG, ANDERSON, OLIVER, McCAFFREY, PANGBORN, FARMER, SCORTIA $1.75

INFINITY [Lancer – Robert Hoskins, Editor / "New Writings in Speculative Fiction" Both: $2.25
No.2 ('71) GD (crease) CLARKE,GUNN,NOLAN,SILVERBERG $1//// No.4 ('72) VG KOONTZ,LEIBER,MALZBERG,JAKES,GOULART $1.50

ORBIT [Berkley – Damon Knight, Editor All three books: $5.00
No.7 FINE (Bagged;1970) CAROL EMSHWILLER,GENE WOLFE,GARDNER DOZOIS,KATE WILHELM,LAFFERTY,DISCH,KEITH LAUMER $3.50
No.9 GOOD ('71) WILHELM,NEVILLE,V.VINGE,LEE HOFFMAN $1.25//No.11 FAIR (cov.loose;'72)POHL,FARMER,DANN,HALDEMAN $1.00

STELLAR [Ballantine – Judy-Lynn del Rey, Editor Buy #1 (NVG), #2, #4 ~~& #5~~ all for ~~$10~~ $7.00
~~No.1 FAIR ('74;creased) CLEMENT,NIVEN,ROTHMAN,SIMAK $1.00~~/No.1 NVG (1974) DICKSON,FOSTER,LAFFERTY,SILVERBERG $2.00
No.2 VG+ (1976) ASIMOV,CONNER,HALDEMAN,SIMAK,NIVEN $3.00//No.4 VG HrdCvr'78/BC/(DW sp.fade)TIPTREE,FOSTER,BOVA$3.00
No.5 VG+ (1980) MARION ZIMMER BRADLEY, PHILIP K. DICK, G. C. EDMONDSON, JAMES P. HOGAN, CHARLES SHEFFIELD more $3.00
SOLD

STAR SCIENCE FICTION [One of the first pb "magazine" anthologies; Fredrick Pohl, Editor]
~~No.1 VG (very slight edge chips)(4th pr.11/72)BRADBURY,DEL REY,GOLD,CLARKE,KORNBLUTH,KUTTNER-MOORE,LEIBER,more $2.50~~
No.2 GOOD- (sp.cracks,creases) 1ST ED Ballantine 1953 BESTER,WILLIAMSON,BOUCHER,PRATT,CLEMENT,STURGEON,BUDRYS $2.00

UNIVERSE [Ace – Terry Carr, Editor] All three books below for $5.75
No.1 GOOD+ (sp.crease;BC dirt) (1971) BENFORD,TUCKER,MALZBERG,PANGBORN,SILVERBERG,GOULART,EKLUND,LAFFERTY,more $1.50
No.2 NVG (minor crease FC, creases BC) (1972) HARLAN ELLISON, DOZOIS, BOB SHAW, GENE WOLFE, ROTSLER, RUSS $2.00
No.5 VG Random House HrdCvr/BC/DW (sm.tear)(1974) LeGUIN, WOLFE, NEVILLE, LEIBER, PANGBORN, EFFINGER, BUSBY $3.00

SECTION III. MAGAZINES FOR UFO ENTHUSIASTS – *These are all that are left!*

All items are NVG or better condition unless otherwise stated. Each item is $1.00. *Not plastic-bagged.*

UFO REPORT: Summer, Fall 75; Aug, Sep 77; June 78*; Feb 79; by Editors of *Saga Magazine* 8 X 11 slick, claiming to be "World's #1 UFO Magazine"; incl other mysteries: Bermuda Triangle, Big Foot, Nostradamus

OFFICIAL UFO: July 76 - 8 X 10 predecessor to *Ancient Astronauts*, but less flamboyant.

FLYING SAUCERS-UFO REPORTS: Oct 1967 - 8 X 11 true-slick pre-Apollo-moon-landing "space mysteries" magazine.

*June 1978 has loose cover, but intact

**Corner of BC missing.

*Only ones left

SECTION IV. ACE DOUBLE NOVELS – All at MOVE-'EM-OUT PRICES!! These are NOT BAGGED.

As part of a large trade, I acquired many pbs, including the ACE DOUBLE NOVELS below. (The other pbs are listed accordingly with sf&f pbs.) With no other notation, they are GOOD (or better) @ $1.00 each (3 for $2.75); otherwise, if marked "FAIR," 75¢ each (3 for $2.00). All show wear; where duplicates are listed and are in quasi-equal condition, I'll select unless you dictate otherwise.

~~G-187 Brackett, Leigh: *Alpha Centauri or Die* and Wallis, G.McDonald: *Legend of Lost Earth* Both c.1963~~
~~F-242 Brunner, John: *The Rites of Ohe* and Brunner, John: *Castaways World* Both c.1963~~
76096 Bulmer, Kenneth: *The Ships of Durostorum* and Sutton, Jeff: *Alton's Unguessable* Both c.1970
M-131 Bulmer, Kenneth: [SEE M-131: Reynolds, below]
G-606 Carter, Lin: (FAIR/inked) *The Man Without a Planet* & Rackham, John: *Time to Live*(corn.bent,crease)Both c.1966
*G-606 Carter, Lin: (FAIR/worn) *The Man Without a Planet* & Rackham, John: *Time to Live* (scraped, creased)Both c.1966
~~G-606 Carter, Lin: (NVG-nice) *The Man Without a Planet* & Rackham, John: *Time to Live* (spine slight chip)Both c.1966~~
M-109 Edmondson, G.C.: *Stranger Than You Think* & Edmondson, G.C.: *The Ship That Sailed the Time Stream* Both c.1965
13085 Kamin, Nick: (NVG) *The Herod Men* and Rackham, John: *Dark Planet* (top right FC corner bent) Both c.1971
D-345 North, Andrew: *Plague Ship* (c.1956) & North, Andrew: *Voodoo Planet* (c.1959) (sp. slight wrinkled)
~~D-345 North, Andrew: (FAIR) *Plague Ship* (") & North, Andrew: *Voodoo Planet* (bott.rt.corn.miss,crease)~~
53415 Piserchia, Doris *Mister Justice* (1st ed) and Phillifent, John T.: *Hierarchies* (1st ed) Both c.1973
11650 Reynolds, Mack: (NVG) *Code Duello* (1968) and Reynolds, Mack: *Computer War* (1967) Ace prntg.1973
G-580 Reynolds, Mack: *Dawnman Planet* (Gaughan cover) & Nunes, Claude: *Inherit the Earth* (Hanke cover)Both c.1966
*G-580 Reynolds, Mack: *Dawnman Planet* (Gaughan cover) & Nunes, Claude: *Inherit the Earth* (Hanke cover)Both c.1966
*M-131 Reynolds, Mack: (FAIR) *Planetary Agent X* & Bulmer, Kenneth: *Behold the Stars* (creases) Both c.1965
~~M-131 Reynolds, Mack: (FAIR) *Planetary Agent X* & Bulmer, Kenneth: *Behold the Stars* (creases) Both c.1965~~
*M-131 Reynolds, Mack: (FAIR) *Planetary Agent X* & Bulmer, Kenneth: *Behold the Stars* (creases) Both c.1965
~~37795 Russell, Eric F. (FAIR) *Six Worlds Yonder* (56) & Russell: *The Space Willies* (54-55-56) (creases)~~
~~*The following two books are priced at 50¢ each due to their generally very worn and/or incomplete condition:*~~
~~M-271 Tubb, E.C.: (FAIR) *The Winds of Gath* & Coulson, Juanita: *Crisis on Cheiron* (incomplete miss.6 pp) Both c.1967~~
~~D-31 Van Vogt, A.E.: (Very Worn) *The World of Null-A* (1945/1948) & Van Vogt, A.E.: *Universe Maker* (c.1953) (tattered)~~

MYSTERY NOVELS:
*F-130 Howard, James A.: *The Bullet-Proof Martyr* (c.1961) & Flynn, J.M.: *The Screaming Cargo* (c.1962) (sm.bend,creases)

SECTION V. SCIENCE FICTION AUTHORS' ORIGINAL MAGAZINE MANUSCRIPTS–PRICE CUTS!

Authors' typed mss w/original paper clips (rusted) and editor's marks, in plastic bags.

RAYMOND F. JONES "The Moon is Death" published in *Future Science Fiction* (March 1953, available on Page 4) $15.00
~~SPECIAL OFFER. Buy the Jones ms and the issue in which it appeared for the combined price of $17.50!~~

MICHAEL SHAARA [now famous for *The Killer Angels*, produced for PBS as *Gettysburg*] "Wainer" bought 9/23/52 for *Galaxy Science Fiction Magazine*; has editor's typed blurb cover sheet. $25.00

THEM ALL-SINGING, ALL-DANCING CINEMATIC PULPS

Ah, yes, gimme that ol'-time adventure. I mean LucasFilm's technically enhanced revivals of *Star Wars*, *The Empire Strikes Back*, and *The Return of the Jedi*.

If you are too young to have seen them other than on a 19" screen, you must go – nay! – RUN to your nearest movie house and *experience* these flicks. And if you did see them in a theatre before, you've gotta do it again!

Here're *Amazing Stories*, *Wonder Stories*, and *Planet* and *Startling* ... all brought to life before your eyes – and ears. It was worth the popcorn cholestoral risk to once again be enraptured by THX sound and widescreen blood-and-thunder space opera. Just as in 1977, *Star Wars* etc. brought back to mind the first science fiction novel I ever read: Jack Williamson's *The Legion of Space*.

Referring collectively to the trilogy, *Star Wars* is, as an engineering associate at Westinghouse/Cleveland said about *Robocop*, "the last movie I saw that I understood." Well, not really, but you get the idea. There's no hidden message, no deep mystery, no mysticism (in spite of what subsequent writers have tried to insinuate about the Darth Vader/Luke Skywalker relationship). It's just pure, unadulterated fun!

And if *SF* pulpism-*qua*-movies isn't all to your liking, then go rent any Indiana Jones movie (especially *Raiders of the Lost Ark*), or Tom Selleck's *High Road to China*, or *Romancing the Stone* (but not its sequel).

This cinematic "rush" is the same kind of stuff that many writers tried to live on at a half-cent a word, when they got lucky, in the 1920s, 30s and 40s. It is the fundamental matter of that field of literature we adopted at some point in our lives, one way or another. (Otherwise, why are you reading this?)

It is to today's speculative fiction what the late Carl Sagan's free-electron white-noise is to the Universe. It's part of us and our lives. So enjoy it to its maximum.

– EDWARD MCMANUS

SECTION VI. OTHER MAGAZINES / PULPS (MYSTERY, LITERARY, ROMANCE, & GENERAL)

A. THE MYSTERY GENRE – THINGS OF POSSIBLE INTEREST TO SF&F FANS – PRICED TO SELL!!

ALFRED HITCHCOCK'S MYSTERY MAGAZINE [With "Mystery Classics" by literary/crossover authors.]

Overall range FAIR to NVG, but some FCs marred by mailing label, and a few have creased/bent corner pages and/or FC creases. Individual issues priced @ $1 each OR 3/$2.50!!

1987	January	FR sp damage	Francis Lynde (1912)
	March	GD mail label	Booth Tarkington (1925)
	May	GD mail label	Richard Stern (1959)
	June	NVG	F.Marion Crawford "The Screaming Skull"; Doug Allyn White "Witch"
	August	NVG	Bruce Scates (SF)
	September	GD mail label	Freeman W. Crofts (1921)
	October	GD mail label	
	November	GD mail label	Stacy Aumoniere (1927)
	December	NVG	L.T.C. Rolt (1948)
	MID-Dec	GD mail label	John Steinbeck "How Mr. Hogan Robbed a Bank" ('56)
1988	January	GD mail label	O.Henry (nd), David Braly
	February	FR-GD m.label	A.MERRITT "The Pool of the Stone God"
	March	GD mail label	
	April	GD mail label	Dorothy L. Sayers (1928)
	June	GD mail label	
	July	NVG	
	August	GD mail label	May ("The Grinning God") & Jacques Futrelle ("The House That Was")
	September	GD mail label	Margery Allingham (1939)
	November	NVG m.label	H. G. WELLS "The Man Who Could Work Miracles"
	December	GD mail label	Anon: "The Great Valdez Sapphire" (1908)
	MID-Dec	GD+ m.label	MALCOLM JAMESON "Train for Flushing"

1989	January	GD+ label; FC some wrinkles	Grant Allen (1896-97)
	February	GD mail label	Ring Lardner (1928)
	March	NVG	BILL PRONZINI
	April	GD-NVG	A.A.Milne of *Pooh* (1950)
	May	GD-NVG	Guy de Maupassant (1926)
	June	GD label; FC some wrinkles	FRANK STOCKTON classic
	July	NVG	WILLIAM HOPE HODGSON (nd)
	August	NVG	Margery Allingham (1941)
	September	NVG FC some wrinkles	Mrs. Oliphant "The Open Door"
	October	NVG	Dorothy L. Sayers (1933)
	December	GD mail label	Alfred Noyes (1918)
	WNTR/Dbl Iss	GD-NVG	
1990	January	GD mail label	Charlotte Armstrong (1953)
	February	GD FC some wrinkles	R.Austin Freeman "The Magic Casket"
	March	GD	Robert Louis Stevenson "The Bottle Imp"
	April	GD mail label	ISAAC ASIMOV - a "Batman" story
	June	GD mail label	
	July	GD-NVG	Georges Simenon (1944)

ELLERY QUEEN [ELLERY QUEEN MYSTERY MAG] *NVG; most FCs have mail label.* $1 each OR 3/$2.50!!

1987	December	#537	Digest	
	Mid-Dec	#538	Digest	Index to Vol.90
1988	January	#539	Digest	
	February	#540	Digest	Antonia Fraser
	March	#541	47th Anniv/ISAAC ASIMOV	
	April	#542	Digest	Lillian Jackson Braun of "The Cat Who..." fame
	May	#543	Digest	STEVE ALLEN; MARK RUSSELL; "MISS MANNERS"
	June	#544	Index V.91/ASIMOV; A. Fraser	
	July	#545	Digest	REGINALD BRETNOR
	August	#546	Digest	

1988	September	#547	Digest	Carlton Carpenter
	October	#548	Digest	EDGAR ALLEN POE "The Black Cat"
	November	#549	Digest	LORD DUNSANY
	December	#550	Digest	
	Mid-Dec	#551	Digest	Index to Vol.92
1989	January	#552	Digest	Nan Hamilton "Too Many Pebbles," 1st Sam Ohara story
	February	#553	VG/no label	
	March	#554	NVG/48th All-Star Anniversary Issue: ISAAC ASIMOV	

B. *"ROMANCE AMONG THE PULPS!"–Three FINE examples of what ladies swooned over in the 30s.*

Frank A. Munsey's *ALL-STORY LOVE TALES* – *WEEKLY*

1939	January 7	LXXXI/#2	FINE++	Bagged	Very rare pulp	Beautiful copy!!	$25.00

Street & Smith's *LOVE STORY MAGAZINE* – *ILLUSTRATED*

GONE

Technically this long-lived pulp is simply Love Story, but my mother, addicted to these early romance stories, always called it "Street and Smith's Love Story," and so will I, to honor her memory. Its mainly female readers got serials, novelettes, short stories, and poetry, plus astrological and other features. Plastic-bagged.

1938	April 16	CXLI/#3	FINE	A real collectible!	Rare pulp/130 inside pages	$15.00
	June 25	CXLIII/#1	FINE	A real collectible!	Rare pulp/130 inside pages	$15.00

SALES NOTE: Both Street & Smith issues available at LOT PRICE = $27.00 All three issues above for $50.00

CALL HIM LEGEND – The Pseudonyms of Ray Bradbury

·Doug Rogers ·Ron Reynolds ·Guy Amory ·Anthony Corvais ·E.Cunningham ·Brian Eldred ·D.R.Banet ·Cecil Claybourne Cunningham ·D.Lerium Tremaine ·Edward Banks ·William Elliott ·Brett Sterling ·Leonard Spaulding ·Leonard Douglas ·Douglas Spaulding (the lead character's name in *Dandelion Wine*, incidentally) [from the Internet: *Johnston@On-Ramp.com.* Suggest also looking at the Ray Bradbury Page on the World Wide Web.]

★ SOMETHING BRADBURY THIS WAY COMES An Astounding Encounter of Thrilling Wonder with the Most Fantastic Science Fictionist on This Planet!

Ray Bradbury, Ventura, CA, March 1,1997.

> *DANDELION WINE. The words were summer on the tongue. The wine was summer caught and stoppered. And now that Douglas knew, he really knew he was alive, and moved turning through the world to touch and see it all, it was only right and proper that some of his new knowledge, some of this special vintage day would be sealed away for opening on a January day with snow falling fast and the sun unseen for weeks or months and perhaps some of the miracle by then forgotten and in need of renewal. Since this was going to be a summer of unguessed wonders, he wanted it all salvaged and labeled so that any time he wished he might tiptoe down in this dank twilight and reach up his finger tips.*
>
> \- Ray Bradbury, *Dandelion Wine*, 1957

SO IT WAS on a sun-filled March premièr – a vintage day – I finally met this man, this writer who inspires me, even influenced my destiny some forty-six long years ago. Figuratively, I grew up with Ray Bradbury. But as I stood at the table, my books and magazines held out as in offering for his consecration, my hair now as silvery as his, I did not tell him that. Now those signed publications shall be sealed away for opening on another day, and another, all salvaged and labeled, so that like Douglas Spaulding, I too might tiptoe and reach up my finger tips.

From my collection (and my duplicate trade inventory) I brought two copies of *Astounding Science Fiction* dated April, 1939. In the Brass Tacks section is a letter from a self-described "amateur writer," Ray Douglas Bradbury. He was Librarian for the then-Science Fiction League of Los Angeles. After his remarks to John W. Campbell, Jr. about the stories and artwork in prior issues, he foretold that soon he would deluge John Campbell with manuscripts. That brash prophecy would take more time to be fulfilled than Bradbury expected, however.

He was quite pleased to see these. Reading through the entire letter, he remarked at how difficult it had been to sell fiction, how little it paid. That led him to the subject of what an author in the "golden age" years of the 40s-50s would do to get his work in print.

"I helped start *Playboy*, you know," he told us. "Hugh Hefner was trying to get the magazine started and didn't have much money. He asked me if I'd contribute stories. I did, and they ran in the earliest issues."

The stories he sent Hefner were, as he put it, too potentially controversial for the more standard markets, that being the McCarthy era. "And we all know what a [expletive] he was!" Bradbury added. He cited payments of a couple hundred dollars, low by today's rates, but good for the mid-50s.

Nowell (l.), owner John Miller (standing) and Bradbury

THIS SIGNING was occasioned by the release of a new edition of *The Martian Chronicles* (hardcover by Avon, of all publishers). This is my second signed *MC* copy, my son having obtained one for my birthday several years back.

I bought *Dinosaur Tales*, which Bradbury signed with a sketch of a *tyrannosaurus rex*. My remark that, like Damon Knight, he was an "artist" as well as a writer led to more nostalgia, as did his signing my February 1951 *Galaxy*, featuring "The Fireman," predecessor to *Fahrenheit 451*. "That's the temperature at which book paper burns," he reminded us, lest we had forgotten.

He not only graciously consented to photographs but also videotaping. He told Carole, my wife, as she aimed the camcorder, "Go ahead, if you want to waste it on me." Wasted on Bradbury? Never! The photos and video are new treasures, vintage Dandelion Wine for opening on many another day. – VINCE NOWELL

Bradbury signs April 1939 *Astounding* containing his letter to the editor, when this 18-year-old self-described "amateur writer" was still two years away from his first story sale. The issue is available. (See page 5.)

TWO NEW "GOLDEN APPLES" FROM RAY BRADBURY

Ray Bradbury: *Zen in the Art of Writing*, Joshua Odell Editions, Santa Barbara, CA, 1996, 176 pp, trade paper, $11.95

Ray Bradbury: *Dinosaur Tales*, Foreword by Ray Harryhausen, Introduction by Ray Bradbury, various illustrators, Barnes & Noble Books, NY, 1996, 144 pp, cloth, DW, $20.00.

Zen is not just a book for writers, but for _thinkers_ who would be _do-ers_! A wonderful ice-cream-suit romp through the world of Bradbury's imagination, from the child who dared to grow up and remember what that child saw, heard, tasted, felt, to the adult observer of the world and people, who breathes life into book paper. Mr. Bradbury explains why _Dandelion Wine_, how _The Martian Chronicles_, and for whom _Something Evil This Way Comes_. Read it with a receptive mind. Lots of fun!

Tales has Mr. Bradbury's behemoths, from the lonely beast in "The Foghorn" to the hunted creature in "A Sound of Thunder," and all the others in between. Yeah, you've probably read them before, and most have been anthologized, but that doesn't detract a bit from the delight of having these four tales and two poems, all so wonderfully illustrated by Gahan Wilson, Moebius, Steranko, David Wiesner, and others, between two hard covers. Get it! Read it! Enjoy it! Give it to someone you love, or better yet, KEEP IT!

Thanks to Owner John Anthony Miller and Manager Katie Crawford of the PHANTOM BOOKSHOP, 451 E.Main St., Ventura, CA 93001, for sponsoring the signing, and providing the opportunity to meet Ray Bradbury. Call (805) 641-3844 [fax (805) 641-1246] or 1-800-99-PHANTOM for availability of these books (or anything in the stf/horror categories). Also check out their gorgeous web site: **phantom@phantoms.com**. *Please tell 'em where you read this.*

✱ SECTION VII. PAPERBACK & HARD-COVER BOOKS - Condition codes for all books are as follows:

MINT = Pristine/NEVER READ (pers.collectn.) VF = Near new/NEVER READ FINE = Read once but LOOKS NEW
NF = NEAR-FINE/looks great! but had some use VG = Aver.for age/COLLECTIBLE NVG = Shows wear/sm. problems
GD = GOOD/reader copy/shows wear &/or damage FR = FAIR/rough but readable POOR = As denoted/bad conditn
+/- = ½-gr up/down @ = Very minor blemishes % = More pronounced wear/tear DW condition (HCs) noted separately

A. SCIENCE FICTION / HORROR PAPERBACK BOOKS

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	PRICE
ACE DOUBL NOVEL	See Page 12.		SF&F			
ANTHOLOGIES-PB	See Page 11.		SF&F			
~~Amis,~~	~~Kingsley~~	~~New Maps of Hell (Analysis of SF) [VINTAGE]~~	~~SF/HISTORY~~	~~Ballantine c.1960~~	~~FR %~~	~~2.00~~
Anthony,	Piers	A TRILOGY: Incarnations of Immortality [below]	FANTASY-vj			11.00
Anthony,	Piers	Bearing an Hourglass - #2 Incarnations of Immortal	FANTASY-vj	Ballantine/DelRey 1st,1985	VF	4.50
Anthony,	Piers	On a Pale Horse - #1 Incarnations of Immortality	FANTASY-vj	Ballantine/DelRey 6th,1986	NF	4.00
Anthony,	Piers	With a Tangled Skein - #3 Incarnations of Immortal	FANTASY-vj	Ballantine/DelRey 1st,1986	VF	4.50
Asimov,	Isaac	Foundation's Edge [Series #4]	SF	Ballan/DelRey, 1982	GD %	1.25
~~Asimov,~~	~~Isaac (Ed.)~~	~~Before the Golden Age / Book 1 [VINTAGE]~~	~~SF&F~~	~~Fawcett Crest pb, 1975~~	~~FINE~~	~~5.00~~
~~Asimov,~~	~~Isaac (Ed.)~~	~~Before the Golden Age / Book 3 [VINTAGE]~~	~~SF&F~~	~~Fawcett Crest pb, 1975~~	~~FR %~~	~~1.00~~
Asimov, Isaac	S.Williams,Ed.	Science Fiction by Asimov [Illustrated-Hank Jankus]	SF/CLASSIC	Davis Publ/thin dig.pb,nd	VF	10.00
Balmer, Edwin &	Philip Wylie	**See Wylie, Philip & Edwin Balmer**	SF			
Bellamy,	Edward	Looking Backward 2000-1887/Fwd Erich Fromm[VINTGE]	SF/CLASSIC	Signet/New Am.Libr, 1960	FINE	7.50
Bishop,	Michael	No Enemy But Time	SF	PcktBks Timescape 1stEd'83	GOOD	2.00
Blish,	James	Cities in Flight [2 pb volumes, sold as a set]	SF	Baen/Sim-Schust pb, 1992	FINE	4.00
Bradbury,	Ray	The Golden Apples of the Sun [VINTAGE]	SF/CLASSIC	Bantam Giant 1st, 11/54	FR %	2.00
Caidin,	Martin	Cyborg [VINTAGE]	SF-vj	Warner 2nd pr, 1974	GD %	1.00
Capek,	Karel	War With the Newts [w/Intro.] [VINTAGE]	SF	Bantam Classic, 1st, 10/59	VG @	5.75
Carter,	Carmen	STAR TREK #34: Dreams of the Raven [X-indexed]	SF	Pocket Books, 1987	MINT	3.00
Conklin,	Groff, Ed.	13 Above the Night [VINTAGE]	SF	Dell Orig. c. 1965	NVG@	3.50
Conklin,	Groff, Ed.	13 Above the Night [VINTAGE]	SF	Dell Orig. c. 1965	GD+	3.00
Conklin,	Groff, Ed.	13 Above the Night [VINTAGE]	SF	Dell Orig. c. 1965	GD+	3.00
Conklin,	Groff, Ed.	13 Great Stories of SF [VINTAGE]	SF/CLASSIC	Fawcett/Gold Medal 1960	NVG@	3.50
~~Conklin,~~	~~Groff, Ed.~~	~~5 Unearthly Visions [Novelettes] [VINTAGE]~~	~~SF/CLASSIC~~	~~Fawcett Gold Medal, c.1965~~	~~NVG@~~	~~3.50~~
Conklin,	Groff, Ed.	Dimension 4 [4 SF Novelettes] [VINTAGE]	SF/CLASSIC	Pyramid Books, 1964	NVG	4.00
Conklin,	Groff, Ed.	Great Stories of Space Travel [VINTAGE]	SF	Tempo orig/2nd Prntg, 1970	VG+	5.50
Conklin,	Groff, Ed.	Science Fiction Terror Tales [VINTAGE]	SF/HORROR	Pocket Bk 2nd Prntg 1969	GD @	2.25
Conklin,	Groff, Ed.	The Supernatural Reader [VINTAGE]	HORROR	Collier, 5th Prntg, 1966	NVG@	3.50
DeCamp,L.Spragu	& Lin Carter	Conan of Aquilonia [VINTAGE]	FANT/CONAN	Prestige/Ace PB, 1977	GOOD	2.50
DeCamp,L.Spragu	& Lin Carter	Conan the Barbarian [Oliver Stone scrnplay novel]	FANT/CONAN	Bantam 1982	MINT	3.00
DeCamp,L.Spragu	&Robt.E.Howard	Conan the Usurper [VINTAGE]	FANT/CONAN	Prestige Ace 1967	NVG@	3.50
Del Rey,	Lester	Rockets Through Space [Non-Fiction][VINTAGE]	SPACE SCI.	Premier 1st, 1960	POOR	.75
~~Delaney,~~	~~Samuel R.~~	~~Distant Stars [illustrated]~~	~~SF~~	~~Bantam trade pb, 1981~~	~~MINT~~	~~7.50~~
Duane/Morwood,	Diane & Peter	STAR TREK #35: The Romulan Way [X-indexed]	SF	Pocket Books, 1987	MINT	3.00
Eco,	Umberto	Focault's Pendulum	FANTASY	Ballantine 1st US ed, 1990	FINE	4.00
Edwards,Malcolm	Robt.Holdstock	Tour of the Universe [Very lg.oversize trade pb]	SPACE SCI.	Mayflower 1st USA, 1980	MINT	21.00
Ferman,	Edward L.	The Best from F&SF #16 [VINTAGE]	SF&F	Ace, c. 1965, 1966, 1967	GD %	2.25
Gipe,	George	Gremlins/Steven Spielberg Presents [from scrnplay]	SF&F-vj	Avon 1st pr, 1984	VG	2.00
Gold,	H. L., Ed.	5 Galaxy Short Novels [VINTAGE]	SF/CLASSIC	Permabook 1st, 1960	GOOD	2.50
Gold,	H. L., Ed.	The Fourth Galaxy Reader [VINTAGE]	SF/CLASSIC	Permabook 1st, 1960	GD %	2.00
Golding,Wm John	Wyndham & Peak	Sometime, Never [3 novels] [VINTAGE]	SF&F/CLSIC	Ballantine Orig, c.1956	GD %	2.00
Hackett, Genl.	Sir John et al	The Third World War: August 1985	SF	Berkley, 1980	MINT	5.50
Harrison,	Harry	Winter in Eden/pb edition	SF	Bantam pb, 1987	VG	4.00
Harrison, Harry	Ed. [VINTAGE]	Astounding (13 orig.stor) (Campbell Memorial)	SF	Ballantine Orig, c.1973	NF @	5.50
~~Harrison, Harry~~	~~Ed. [VINTAGE]~~	~~Astounding (13 orig.stor) (Campbell Memorial)~~	~~SF~~	~~Ballantine Orig, c.1973~~	~~NVG@~~	~~3.75~~
Heinlein,	Robert A.	The Man Who Sold the Moon [4 stories] [VINTAGE]	SF/CLASSIC	Signet, 2nd Prntg, 1959	GOOD	2.50
Hilton,	James	Lost Horizon [VINTAGE]	FANTASY	Pocket Books 54th pr, 1963	VG @	2.75
Howard,Robert E	& L.S.De Camp	Conan the Usurper [VINTAGE]	FANT/CONAN	Prestige Ace 1967	NVG@	3.50
Karp, Marvin A.	&Irving Settel	Suddenly [VINTAGE]	SUSP/HORR	Popular Library, c. 1965	NVG@	4.00
Koontz,	Dean	Coldfire	SF	Berkley	GOOD	2.50
~~Koontz,~~	~~Dean~~	~~Dark Rivers of the Heart~~	~~FANTASY~~	~~Ballantine 1st US pb, 1995~~	~~VG+~~	~~3.50~~
Koontz,	Dean	Strange Highways [2 novels+ss]	SF&F	Warner 1st pb, 1996	VG	3.00
Koontz,	Dean	Strangers	SF/HORROR	Berkley	GOOD	2.50
Kotzwinkle,	William	E.T. The Extra-Terrestrial [from screenplay]	SF-vj	Berkley 6th pr, 1982	VG	3.00
Lewis,	C.S.	Both volumes below (#2 & #3 in trilogy)	SF/CLASSIC	[VINTAGE]		10.00
Lewis,	C.S.	Perelandra [#2 in trilogy] [VINTAGE]	SF/CLASSIC	Avon 1st pb #277, 1950	VG	6.00
Lewis,	C.S.	That Hideous Strength (#3 in trilogy) [VINTAGE]	SF	Macmillan 1st pb, 1965	NVG	5.00
Lofts,	Norah	Gad's Hall [VINTAGE]	TERROR	Fawcett Crest, c.1977	VG+	4.50
Lofts,	Norah	Haunting of Gad's Hall, The [Sequel]	TERROR	Fawcett Crest 1st pr, 1980	GD %	2.00
Lofts,	Norah	The Old Priory	TERROR	Avon 1st pr, 1983	NVG	4.00
~~London,~~	~~Jack~~	~~Thirteen Tales of Terror / Ed,Intro John Perry~~	~~FANTASY~~	~~Popular Library, 1978~~	~~NVG@~~	~~3.50~~
Lundwall,	Sam J.	Science Fiction - An Illustrated History	SF/HIST-vj	Grost/Dnlp 1st US ed, 1978	NF @	19.00
MacAvoy,	R.A.	The Book of Kells	FANTASY	BantamSpect 1st Ed pb 1984	MINT	4.50
Margulies,	Leo, Ed.	3 From Out There (3 novels) [VINTAGE]	SF/CLASSIC	Fawcett/Crest 1st, 1959	FR %	1.50
McCammon,	Robert R.	Blue World [short stories]	HORROR	Pocket Books 1st Ed, 1990	FINE	4.50
McCammon,	Robert R.	Gone South	FANTASY	Pocket Books/Star pb, 1993	VG	3.00
Merle,	Robert	The Day of the Dolphin [VINTAGE]	SF/THRILLR	Fawcett Crest, 1970	FR %	1.50
Merritt,	A.	All 4 below - matching cover formats	SF&F	Avon		16.00
Merritt,	A.	Seven Footprints to Satan	FANTASY	Avon 13th prntg. ca. 1978	NF	5.50
Merritt,	A.	The Face in the Abyss	FANTASY	Avon 1st pb, April 1978	NF @	5.00
Merritt,	A.	The Metal Monster	SF	Avon, 6th prntg, ca. 1978	NF	5.50
Merritt,	A.	The Ship of Ishtar	FANTASY	Avon /5th prntg, ca. 1978	NF @	5.00
Moskowitz, Sam	& Roger Elwood	Other Worlds, Other Times [VINTAGE]	SF/CLASSIC	McFadden-Bartell, 1969	FAIR	1.50
No Ed. Credits		Questar Illust.SF Clascs [Campbell Who Goes There]	SF-vj	Golden Pr ovsize pb, 1979	NVG@	5.00
Pohl,	Frederik	Drunkard's Walk [VINTAGE]	SF/CLASSIC	Ballantine Orig., c.1960	NVG	4.00
Pohl,	Frederik	Tomorrow Times Seven (sh.stor)	SF/CLASSIC	Ballantine 2nd Prntg, 1969	NVG@	3.50
Pohl,	Frederik	Tomorrow Times Seven (sh.stor) [VINTAGE]	SF/CLASSIC	Ballantine 1st pb, 1959	GD+	3.00
Pohl,Frederik &	C.M. Kornbluth	The Space Merchants [VINTAGE]	SF/CLASSIC	Ballantine 9th Prntg, 1976	VG	5.00
Pohl,Frederik &	C.M. Kornbluth	The Space Merchants [near-VINTAGE]	SF/CLASSIC	Ballantine 11th Prntg,1978	VG+	5.50
Pohl,Frederik &	Carol Pohl,Ed.	Science Fiction Discoveries [VINTAGE]	SF	Bantam, 1976	FAIR	1.50
Popescue,	Petru	Almost Adam	ANTHRO-SF	Avon 1st PB, February 1997	FINE	5.50
STAR TREK #34	[X-indexed]	Dreams of the Raven by Carmen Carter	SF	Pocket Books, 1987	MINT	3.00
STAR TREK #35	[X-indexed]	The Romulan Way-Diane Duane & Peter Morwood	SF	Pocket Books, 1987	MINT	3.00
Silverberg,	Robert[VINTAG]	Lost Cities & Vanished Civilizations [sf author]	ARCHEOLOGY	Bantam Pathfinder, 1963	MINT	10.00
Smith, Cordelia	Titcomb	Great Science Fiction Stories [VINTAGE]	SF/CLASSIC	Dell/Laurel-Leaf 1stPB1964	FINE	7.00
Smith, Cordelia	Titcomb, Ed.	Great Science Fiction Stories [VINTAGE]	SF/CLASSIC	Dell/Laurel-Leaf,1stPB1964	FR %	2.00
StefenSantesson	Hans, Ed	The Fantastic Universe Omnibus [VINTAGE]	SF/CLASSIC	Paprbk Lbr,1960 (LibrCopy)	POOR	1.00
Tryon,	Thomas	The Other [VINTAGE]	HORROR	Fawcett Crest pb, 1972	GOOD	2.00
Tryon,	Thomas	The Other [VINTAGE]	HORROR	Fawcett Crest pb, 1972	BAD%	.50
Turtledove,	Harry	A Different Flesh AUTOGRAPHED COPY!	SF	Baen 1st pb 1994 SIGNED!!	FINE	8.00
Verrill,	A. Hyatt	The Strange Story of Our Earth [SF author/VINTAGE]	PREHISTORY	Fawcett Premier, 1956	VG @	5.00
Wells,	H. G.	The Time Machine	SF-vj	Ventura pb edition, 1980	VF	3.00
Woods,	Jack	Woffile	HORROR-vj	Pageant 1st pr, 1988	VG	3.00
Wylie,	Philip	]he Spy Who Spoke Porpoise [VINTAGE]	SF/SPY	Pyramid, 1970	VG+	3.50
Wylie, Philip &	Edwin Balmer	When(& After)Worlds Collide/SOLD AS SET [VINTAGE]	SF	Paperback Libr,5th pr,6/70	NVG%	5.00

B. SCIENCE FICTION / HORROR HARD-COVER BOOKS

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	DW/BOOK DESCRIPT	PRICE
Adams,	Douglas	The Hitchiker's Guide to the Galaxy	SF-vj	Harmony/Crown BC ed,c.1979	FINE	DW shows wear	4.50
Aldiss,	Brian	Helliconia Spring [Vol 1]	SF	Atheneum, BC ed, 1982	MINT	DW sm scratches	8.50
Aldiss,	Brian	Helliconia Summer [Vol 2]	SF	Atheneum, BC ed, 1983	MINT	DW FINE	9.50
Aldiss,	Brian	Helliconia Winter [Vol 3]	SF	Atheneum, BC ed, 1985	MINT	DW sm.chips,wrnk	8.50
Aldiss,	Brian	The Helliconia Trilogy[3v set]	SF	Atheneum, BC ed, 1982-3-5	MINT		24.00
Anderson,	Poul	The Avatar	SF	Berkley	N-F	DW/chps,sm.gouge	4.00
Asimov/Silv'brg	Isaac & Robert	The Positronic Man	SF	Doubleday BC ed, 1992	FINE	DW tiny chips	3.50
Betancourt,	John (Ed.)	Best of Weird Tales [from Terminus Publ. series]	FANT/HORR	Barnes-Noble 1st Ed.,1995	MINT	DW Mint	10.00

Canter,	Mark	Ember From the Sun	SF	Delacorte Pr/BC ed., 1996	FINE VERY FINE	7.5
Caras,	Roger [Ed.]	Treasury of Great Cat Stories	SF/MYSTRY	Galahad Books, 1990	MINT DW Mint	13.0
Clarke,	Arthur C.	The Songs of Distant Earth	SF	Ballant/DelRey 1st Ed,1986	MINT DW Mint	15.0
Darnton,	John	Neanderthal	Anthro-SF	Random House TrdPB/1st '96	N-F	10.0
Delaney,	Samuel R.	Stars in My Pocket Like Grains of Sand	SF	Bantam, 1984	MINT DW Mint plastcov	8.
Dickson,	Gordon R.	In Iron Years (short stories)	SF	Doubleday 1st Ed, 1980	FINE DWsm.chips,scrat	13.
Harrison,	Harry	Deathworld Trilogy, The [1 vol]	SF	Doubleday BC ed, 1960-4-8	MINT DW very sm.chips	8.
Harrison,	Harry	Eden Trilogy [3 vol set]	SF	Bantam, BC ed., 1984-6-8	MINT	21.
Harrison,	Harry	Return to Eden/Illos by Bill Sanderson [V.3 trilg]	SF	Bantam, BC ed, 1988	MINT DW sm.corn.chips	8.
Harrison,	Harry	West of Eden/Illos by Bill Sanderson [V.1 of tril]	SF	Bantam, BC ed., 1984	MINT DW Mint	9.
Harrison,	Harry	Winter in Eden/Illos by Bill Sanderson [V.2 trilg]	SF	Bantam, BC ed, 1986	MINT DW F sm.sp chips	8.
Herbert,	Frank	Four [in 1 vol below]	SF	Avenel/Crown, 1984	MINT DW Mint	9.
Herbert,	Frank	Soul Catcher	SF			
Herbert,	Frank	The Dosadi Experiment	SF			
Herbert,	Frank	The Santaroga Barrier	SF			
Herbert,	Frank	Whipping Star	SF			
Matheson,	Richard	Earthbound	FANTASY	Tor 1st Edition, 1994	NF DW sm.tear,marks	5.
McCaffrey,	Anne	The Ireta Adventure [2 "Dinosaur Planet" novels]	SF	Doubleday BC ed, c.1978-84	FINE DW FINE	9.
Niven,	Larry	N-Space	SF/ESSAYS	Tor, 1990	VF DW sm.corn.chips	11.
Pohl/Williamson	Frederik/Jack	The Saga of Cuckoo [Farthst Star/Wall Around Star]	SF	Doubleday BC ed, nd	NF DW	7.
Ryan,	Alan (Ed.)	Perpetual Light	SF/SPECUL	Warner BC ed., nd ['80s]	MINT DW Mint	11.
Silverberg,Robt	& M.Greenberg	Tales of Science Fiction (Intro Silverberg)	SF	Galahad, nd	MINT DW	7.
Stewart,	Fred Mustard	The Methuselah Enzyme	SF	Arbor House, 1970	GD @ no DW	1.
Vinge,	Joan D.	Alien Blood ["Psion" and "Catspaw" novels]	SF	Doubleday BC ed, c.1982-88	FIN@ DW&bk corn.bent	8.
Vinge,	Joan D.	Dreamfall [Sequel to Alien Blood]	SF	Warner (BC ed), 1996	FINE DW Fine	7.
Vinge,	Joan D.	Vinge's "Cat" Series (Both above)	SF			14.
Wilson,	Robert Charles	The Harvest	SF	Bantam Spectra HC/BC, 1993	MINT DW Mint	9.

C. THINGS STRANGE AND UNKNOWN (NONFICTION) - PAPERBACK BOOKS

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	PRIC
Anson,	Jay	The Amityville Horror [VINTAGE]	OCCULT	Bantam, 1978	VG+	4.5
Blofeld,	John (Ed/Trns)	I CHING	PREDICTION	Dutton, 1968	FINE	7.5
Geddes,	Sheila	Astrology	ASTROLOGY	Ideals 1st US trdpb, 1980	VG+	3.
Goodman,	Linda	Sun Signs [VINTAGE]	ASTROLOGY	Bantam, 1971	VG	2.
Hazen,	Barbara Shook	You and Your Lucky Stars [VINTAGE]	ASTROLOGY	Golden Press, 1970	FINE	5.
I CHING Books:	See:	PBs: Blofeld & Ponce HCs: Liu & Murphy	PREDICTION			
Lindsey,	Hal [VINTAGE]	The Late Great Planet Earth	RELIG/OCCL	Bantam 20th prntg, 1977	FINE	5.
Ponce,	Charles[VINTG]	I CHING, Nature of/Usage/Interpretation	PREDICTION	Award Books 1st pr, 1970	FINE	7.

"How'd They Get That Way?"

Today, every time I open a package of magazines ordered from a dealer 'cross country, I experience a joy not even equaled by the thrill of Christmas when I was a child. There, mine to hold, read, treasure, are the *Amazing Stories Quarterly* of the 1930s, the *Super Science Stories* of the 40s, the ever-so-wonderful *Galaxy* issues on which I cut my stf teeth as a teenager in 1950. Once more I own those fresh-off-the-newsstand and clean, bright, brown-envelope-mailed gems that once dwelt in my original collection.

But wait! These I just bought for $8, $12, $20 or more, aren't fresh. They don't appear as clean and bright as I remember those 25¢ and 35¢ periodicals. Some of these are nicked, chipped, marked upon with pen or pencil, even torn, and spattered here and there with ugly tape. So covers are loose, spines faded. The pages look more br wnish than white on some. These look less cared-for *less loved* than my former issues. They have wrinkle and display evidence of wear and tear.

Hell, now that I think of it, many of these magazi look *old!!*

Reminds me of my high school pals and movie idols of youth. They too now look old.

That makes no sense. *I haven't changed!* When did it a happen? How'd they get that way?

- VINCE NOWE

D. THINGS STRANGE AND UNKNOWN (NONFICTION) - HARD-COVER BOOKS

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND DW/BOOK DESCRIPT	PRICE
Baigent,	Michael et al	Holy Blood, Holy Grail [Religious speculation]	RELIGION	Delacorte 1st US ed, 1982	FINE DW VG+	15.00
Frazer,	Sir James	The NEW Golden Bough/Abridg Ed by Theodor H.Gaster	ANTHROPOL	Criterion Books, 1959	NF DW edge chips	32.00
I CHING Books	See:	HCs Liu & Murphy PBs: Blofeld and Ponce	PREDICTION			
Liu,	Da (Translatr)	I CHING Coin Prediction	PREDICTION	Harper & Row 1st Ed, 1975	MINT DW Fine	9.00
McFarland,	Kevin	Incredible But True! [collect of the extraordnry]	FACT-vj	Bell/Crown ed, 1978	VG+ DW torn/complete	8.50
Murphy,	Joseph	I CHING, Secrets of the	PREDICTION	Parker, 1970	MINT DW Fine	9.00
Robbins,	Rossell Hope	The Encyclopedia of Witchcraft and Demonology	OCCULT	Crown BC ed, 1959	NF DW corn worn/chp	33.00
Russell,	Jeffrey Burton	The Devil/Percept.Evil Antiqty-Primtv. Christianty	RELIG/HIST	Cornell Univ 1st Ed, 1977	MINT DW Mint	19.00

E. THE MYSTERY GENRE - PAPERBACK BOOKS

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	PRICE
Avallone,	Michael	Five-Minute Mysteries - From the Files of Ed Noon	MYSTERY-vj	Scholastic 1st ed pb, 1978	VF	1.00
Brown,Rita Mae	& Sneaky Pie	Murder at Monticello (Cat & Mrs.Murphy Mystery)	MYSTERY	Bantam, October 1995	N-F	3.00
Burton,	Anne	Worse Than a Crime [Canada]	MYSTERY	Raven House 2nd pr, 1982	VF	4.75
Carr,	Caleb	The Alienist	SUSPENSE	Bantam, 1994	NVG@	2.00
Christie,	Agatha	The Man in the Brown Suit	MYSTERY-vj	Berkley pb ed, 1984	FINE	3.00
Clancy,	Tom	The Hunt for Red October	SPY/THRILL	Berkley 1st pb, 1985	MINT	4.00
Deighton,	Len	An Expensive Place to Die [VINTAGE]	THRILLER	Berkley Medallion, 1977	NVG	2.50
Deighton,	Len	Yesterday's Spy [VINTAGE]	SPY/THRILL	Warner Books, 1975	FINE	3.50
Deighton,	Len [VINTAGE]	Catch a Falling Spy [Twinkle, Twinkle Little Spy]	SPY/THRILL	Pocket Books 3rd pr, 1977	NF @	3.00
Derleth,	August	Adventures of Solar Pons #1 "ReShrlk Hlmes" [VNTG]	MYSTERY	Pinnacle, 1974 prntg (Nov)	VG+	5.50
Derleth,	August	Chronicles of Solar Pons (#2) [VINTAGE]	MYSTERY	Pinnacle, 1974 prntg (Dec)	N-F	7.00
Derleth,	August	Mr.Fairlie's Last Journey (#7) [VINTAGE]	MYSTERY	Pinnacle, 1976 (May)	VG+	6.00
Derleth,	August	The Solar Pons 3-book set [VINTAGE]	MYSTERY	Pinnacle, 1974 & 1976		15.50
Diehl,	William	27 [Twenty-seven]	THRILLER	Ballantine 1st pb, 1991	FINE	3.50
Erdrich/Dorris	Louise/Michael	The Crown of Columbus	HIST/MYST	Harper 1st pb pr, 1992	VG+	2.50
Flynn,	J.M. [VINTAGE]	The Screaming Cargo (Ace Dbl-Howard)	MYSTERY	Ace Double F-130, c.1962	GOOD	2.25
Forsyth,	Frederick	The Day of the Jackal	THRILLER	Bantam, 1980 printing	MINT	6.00
Forsyth,	Frederick	The Odessa File [VINTAGE]	WWII/THRIL	Bantam, 1974	VF	5.00
Gill,	B.M.	Death Drop [trade pb]	MYSTERY	Scribners 1st US ed, 1979	VF	7.00
Gordon,	A.C.	Mystery Stories [1 & 5-min u-solve 'em mysteries]	MYSTERY	HIS Publ.,digest size,1995	MINT	5.00
Grady,	James	Six Days of the Condor [VINTAGE]	THRILLER	Dell 1st pr, 1975	GD+@	2.50
Halliday,	Brett	Dividend on Death [Canada / a Mike Shayne Mystery]	MYSTERY	Raven House 1st repr, 1982	VF	5.00
~~Harris,~~	~~Thomas~~	~~The Silence of the Lambs~~	~~MYST/TERR~~	~~St.Martin's Pr pb, 1989~~	~~FR-$~~	~~.79~~
Heywood,	Joseph	The Berkut	WWII/THRIL	Dell, 1988	VG	2.00
Howard,	James A.	Death Audit [Canada]	MYSTERY	Raven House 2nd pr, 1982	VF	4.75
Howard,	James A.	The Bullet-Proof Martyr (Ace Dbl-Flynn) [VINTAGE]	MYSTERY	Ace Double F-130, c.1961	GOOD	2.25
James,	P.D.	The Skull Beneath the Skin	MYSTERY	Warner 1st pr, 1983	MINT	4.00
Kaminsky,	Stuart	The Death of a Dissident	MYSTERY	Ace Charter 1st pr, 1981	VG+	2.00
Leek,	Margaret	The Healthy Grave [Canada]	MYSTERY	Raven House pb 1st Ed,1980	VF	4.75
Olcott,	Anthony	Both Russian Mysteries (below)	MYS-RUSSIA			4.50
Olcott,	Anthony	May Day in Magadan [Sequel Murder @ Red October]	MYS-RUSSIA	Bantam pb, 1984	VG	2.00
Olcott,	Anthony	Murder at the Red October	MYS-RUSSIA	Bantam 8th pr, 1983	NF	3.00
Sanders,	Lawrence	Stolen Blessings	SUSPENSE	Berkley, 1989	MINT	3.00
Sanders,	Lawrence	Tales of the Wolf: The Cases of Wolf Lannihan	SUSP/MYST	Avon 1st pr, 1986	NVG@	2.00
Semyonov,	Julian	Tass is Authorized to Announce	THRILLER	Avon 1st US pr, 1988	FINE	4.50
Shannon,	Dell	Case Pending [Canada]	MYSTERY	Raven House 2nd pr, 1982	VF	4.75
Shannon,	Dell	Rain With Violence [Canada]	MYSTERY	Raven House pb, 2d pr,1980	VF	4.75
Smith,	Martin Cruz	Gorky Park	MYS-RUSSIA	Ballantine 1st US ed, 1982	MINT	5.00

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	PRI
Uhnak,	Dorothy	False Witness	LAW/MYSTRY	Fawcett Crest/Ball, 1982	VG+	3.
Uhnak,	Dorothy	The Investigation	LAW/MYSTRY	Pocket Books 1st pr, 1978	VG	2.
Uris,	Leon	QB VII	WWII/THRIL	Bantam, 1980 printing	NF	3.
West,	Morris	"Proteus"	THRILLER	Bantam 6th pr, 1981	MINT	3.
Wheatley,	Dennis	Murder Off Miami [u-solve: clues, solution INTACT]	MYSTERY	Hutchinson LgTrPaper repr.	MINT	25.
Williams,	Wynn	Take the Money and Die [Canada]	MYSTERY	Raven House 2nd pr, 1982	VF @	4.
Wolfe,	John	Drilling for Death [Canada]	MYSTERY	Raven House pb 1st Ed,1980	VF	4.
Wylie,	Philip	The Spy Who Spoke Porpoise [VINTAGE]	SF/SPY	Pyramid, 1970	VG+	5.

F. THE MYSTERY GENRE - HARD-COVER BOOKS

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND DW/BOOK DESCRIPT	P
Caras,	Roger (Ed.)	Treasury of Great Cat Stories	SF/MYSTRY	Galahad Books, 1990	MINT DW Mint	1
Deighton,	Len	Violent Ward	MYSTERY	Harper Collins 1st Ed,1993	MINT DW Mint	7
Doyle, Sir	Arthur Conan	The Works of A.Conan Doyle 1-Vol Ed [est age >100]	MYSTERY	Walter J. Black, NY, nd	VG leath deterior'g	8
Nolan,William F et al		Murder in Los Angeles -D.C.Fontana, Jon Breen, etc	MYSTERY	Morrow 1st Ed, 1987	VF DW VF	1

G. HARD-COVER ANTIQUARIAN & RARE BOOKS - ALL SUBJECTS and FICTION

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND DW/BOOK DESCRIPT	PR
Anonymous		Sel.from Arabian Nights [illust / R.Burton transl]	WORLD/LIT	Book League of Amer, nd	VG publ w/o DW	5.
Botkin,	B.A. (Ed.)	A Treasury of American Folklore/Fwd Carl Sandburg	AM.LIT	Crown, c.1944	VG publ w/o DW	6.
Conrad,	Joseph	Victory	AM.LIT	Modern Library ed, nd	VG publ w/o DW	5.
Cooper,	James Fenimore	The Last of the Mohicans [Academy Classics ed]	HIST/FICTN	Allyn & Bacon, 1945	FINE publ w/o DW	19.
Doyle, Sir	Arthur Conan	The Works of A.Conan Doyle 1-Vol Ed [est age >100]	MYSTERY	Walter J. Black, NY, nd	VG leath deterior'g	85.
Fox, Jr.,	John	The Trail of the Lonsesome Pine	FICTION	Scribners, 1st Ed, 1908	VG publ w/o DW	30.
Hanley	Jack	Let's Make Mary [guide to scientific seduction]	SEX/HUMOR	Phoenix Press, 1937 illust	VG+ publ w/o DW	30.
Irving,	Washington	The Voyage & Other Essays From The Sketch Book	AM.LIT	Hough-Miff,1891/perf.bndPB	NF cov:lt.scribbles	10.
~~Keene,~~ GONE	Carolyn	Both DANA GIRLS Mysteries (below)	MYSTERY		VG	22.
~~Keene,~~	Carolyn	The Circle of Footprints [Dana Girls Mystery]	MYSTERY	Grosset & Dunlap, 1937	VG publ w/o DW may have had DWs	12.
~~Keene,~~	Carolyn	The Secret at Lone Tree Cottage [Dana Girls Myst]	MYSTERY	Grosset & Dunlap, 1934 may be 50s edition	VG publ w/o DW	12.
~~Lester,~~	Paul	The Great Galveston Disaster - Illustrated [1900]	US/HIST-vj	Hoey Publ.Co,Chicago, 1900	VG+ publ w/o DW	75.
~~London,~~	Jack	"Jerry" Book Set (2)	DOG STORY	MacMillan, 1917	VG+ publ w/o DW	20.
~~London,~~	Jack	Jerry of the Islands	DOG STORY	MacMillan, 1917	VG+ publ w/o DW	11.
~~London,~~	Jack	Michael, Brother of Jerry	DOG STORY	MacMillan, 1917	VG+ publ w/o DW	11.
Masson,	Rosaline	A Short History of Scotland the Nation	HISTORY	Thomas Nelson, 1944 prntg.	GD+ publ w/o DW	7.
Remarque,	Erich Maria	All Quiet on the Western Front	WW I/FICTN	Putnam,London,15th pr 1929	FINE publ w/o DW	23.
Seekey,	Mabel	The Listening House	MYSTERY	Doubleday/Crime CLub, 1938	FAIR cov/bind loose	8.
Viereck/Eldridg	G.Sylvstr/Paul	My First 2000 Years/Autobiog of "Wandering Jew"	FICTION	Macaulay, 12th pr, 1930	FINE publ w/o DW	22.
~~Weems,~~	~~John Edward~~	~~A Weekend in September [The Galveston Storm 1900]~~	~~US/HIST-vj~~	~~Henry Holt 1st Ed., 1957~~	~~FINE DW well worn~~	~~12~~

SPECIAL OFFER FOR TRUE HISTORY BUFFS

Knight's *ILLUSTRATED HISTORY OF ENGLAND*, London, 8 vols, publ. 1837 to 1849; leatherbound; gilt-top pp; FINE. I paid $1,200 in 1988. FIRM PRICE: $350, INCL.SHIP/INS.

H. VINTAGE PAPERBACKS [20 or > Yrs] - ALL SUBJECTS & FICTION (Other Than SF&F)

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND DESCRIPTION	PRICE
Adams,	Henry	Democracy	AM/LIT	NAL, 3rd pr, 1961	FINE Durabind "HC"	6.00
Akutagawa,	Ryunosuke	Rashomon and Other Stories [Trans.from Japanese]	WORLD/LIT	Liveright tr.pb, 1970	VF	4.00
Allen,	Hervey	Action at Aquila [Civil War]	ADVENTURE	Pocket Book #370, ca.1946	GD % Title page missg	3.00
Allen,	Hervey	Anthony Adverse in America (adapt.Anthony Adverse]	HIST/FICTN	Dell pb #285, c.1949	VG+	6.25
Asimov(as Dr.A)	Isaac	The Sensuous Dirty Old Man	SEX/HUMOR	Signet 1st pb, 1972	NF	8.50
Bishop,	Jim	The Day Christ Was Born	RELIG/HIST	Pocket Books, 1961	NVG% FC sm.hole,creas	2.00
Bowra,	C.M.	The Greek Experience	HISTORY	Mentor #MD275, 1st pr,1959	VF	7.50
Buckley, Jr.,	William F.	Up From Liberalism [Intr.Goldwater/Fwd Dos Passos]	POLITICS	Hillman, 1961	N-F	7.50
Calder,	Ritchie	Science in Our Lives	SCI/HIST	Signet Key 1st pb, 1955	NVG@ FC bend, creases	2.00
Canby,Courtland	& Nancy Gross	The World of History/Int A.Nevins [HISTORIOGRAPHY]	HISTORY	Mentor #MD109, 1st pr, '54	VF	7.00
Ceram,	C.W.	Gods, Graves and Scholars [classic work]	ARCHEOLOGY	Bantam, 1972	MINT	8.50
Cottrell,	Leonard	The Anvil of Civilization	ARCH/HIST	Mentor #MD197, 1957	MINT	8.50
De Wohl,	Louis	The Living Wood [Relig Fict]	HIST/FICT	Popular Library, 1959	FR % sp.torn,scratchs	1.50
De Wohl,	Louis	The Spear [Relig Fict]	HIST/FICTN	Popular Library #Sp10,1957	GD @ cov creases	2.00
Edwards,	Jonathan	Basic Writings	AM/LIT	NAL, 3rd pr, 1966	FINE Durabind "HC"	5.00
Engel,	Leonard (Ed.)	New Worlds of Modern Science	PHYSIC.SCI	Dell 1st Ed, 1956	NF @ sm.edge chips	6.00
Franklin,	Benjamin	The Autobiography of Benjamin Franklin	HIST/BIOG	Magnum Easy Eye ed, 1968	MINT	5.00
Freeman & Appel	Eugene & David	The Wisdom and Ideas of Plato	PHILOSOPHY	Fawcett Premier 2d pr,1959	FINE	5.00
Hamilton,	Edith	Mythology [worldwide scope]	MYTH/HIST	Mentor #MD86, 7th pr, 1957	NVG@ sm.pc corn missg	4.00
Hawton,	Hector	Philosophy for Pleasure	PHILOSOPHY	Fawcett Premier, 1959	VG @ paper browning	4.00
Hoover,	J. Edgar	Masters of Deceit	POLITICS	Cardinal Giant #GC-39,1961	MINT	6.00
Huxley,	Aldous	After Many a Summer Dies the Swan	LITERATURE	Avon #G-2001, nd (ca.1955)	NVG% sm.hole BC,spine	3.50
Huxley,	Aldous	Crome Yellow	FICTION	Bantam Classic, 1959	NF @ sm.chips spine	4.50
Huxley,	Aldous	Time Must Have a Stop	FICTION	Berkley Medallion, 1960	MINT	5.00
James,	Henry	The American	AM/LIT	NAL, 6th pr, 1963	FINE Durabind "HC"	6.00
Josephson,Eric	& Mary (Eds.)	Man Alone / Alienation in Modern Society	PSYCHOLOGY	Dell 1st Ed/3d pr, 1964	FINE	5.00
Kafka,	Franz	The Penal Colony/Stories and Short Pieces	LITERATURE	Schocken trdpb, 1977 prntg	VG+@ sm. edge chips	7.00
Kafka,	Franz	The Trial [has >10,000 words not in 1st US ed]	WORLD/LIT	Vintage Bks Defin Ed, 1969	FINE@ sm.blemish FC	10.00
Komroff,	Manuel	His Great Journey [life of Christ]	RELIG/HIST	Lion Library, 1956	GD @ sm creases	2.00
Laird,	Melvin R. (MC)	Republican Papers	POLITICS	Doubleday Anchor Orig,1968	MINT	6.00
Levenson,	Sam	Everything But Money	HUMOR	Pocket Books 1st pr, 1967	GD % rolled, creased	2.00
Lofts,	Norah	How Far to Bethlehem? [Relig fict]	HIST/FICTN	Fawcett Crest, nd (1965)	FR % sp torn,cov bend	1.00
Muller,	Herbert J.	The Uses of the Past [Historiography]	HISTORY	Mentor #MD112, 2d pr, 1956	VF	7.00
Napier,	Geoffrey	The Wrong Box	HUMOR-vj	Dell 1st pr, 1966	VG+@ sm.tear spine	5.00
Orwell,	George	Down and Out in Paris and London	AUTOBIOG	Berkley Medallion, 1959	GD % cov-sp separat'g	2.00
Packard,	Vance	The Hidden Persuaders [controversial classic]	PSYCHOLOGY	Cardinal#C-288 7th pr 1959	FINE	5.00
Rolvaag,	O.E.	Giants in the Earth / A Saga of the Prairie	HIST/FICTN	Harper Perren.Classic,1965	VG Permabound "HC"	7.00
Roosevelt,	James (Ed,Int)	The Liberal Papers [trade paper]	POLITICS	Doubleday Anchor Orig,1962	FINE slight sp fading	6.00
Rouse,	W.H.D.	Gods, Heroes and Men of Ancient Greece	MYTH/HIST	Signet Key 1st pr, 1957	FINE	7.00
Schlafly & Ward	Phyllis/Cheste	The Gravediggers	POLITICS	Pere Marquette Pr, 1964	MINT	5.00
Shadegg,	Stephen	Barry Goldwater: Freedom is His Flight Plan	POLIT/BIOG	MacFadden, 1963	NF @ sm.spine crease	4.00

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	DESCRIPTION	PRICE
Silverberg,	Robert	Lost Cities & Vanished Civilizations	ARCHEOLOGY	Bantam Pathfinder, 1963	MINT		10.00
Slaughter,	Frank G.	The Crown and the Cross	HIST/FICT	Permabook 1st pr, 1960	FINE@	sm.scratches FC	5.00
Steinbeck,	John	America and the Americans [photographs]	TRAV/OBSER	Bantam 6th pr, 1968	NF		10.00
Steinbeck,	John	Travels With Charley / In Search of America	TRAV/OBSER	Bantam 30th pr, 1968	MINT		7.00
Storer,	John H.	The Web of Life [1 of first popular books on subj]	ECOLOGY	Signet Key, 1st pr, 1956	VG+		6.00
Stormer,	John A.	None Dare Call It Treason	POLITICS	Liberty Bell,14th Pr, 1964	MINT		5.00
Thoreau,	Henry David	Walden and Civil Disobedience	AM/LIT	NAL, 28th pr, 1960	NF	Durabind "HC"	5.00
Van Loon,	Hendrik	The Story of Mankind	HISTORY	Cardinal Giant #5, 1952-3	VG		5.00
Verrill,	A. Hyatt	The Strange Story of Our Earth	PREHISTORY	Fawcett Premier, 1956	VG @	spine creases	5.00
Vidal,	Gore	1876	HIST/FICTN	Ballantine 2nd pr, 1977	MINT		5.50
Vidal,	Gore	Burr	HIST/FICTN	Bantam, 1974	VG+		4.50
Wallace,	Lew	Ben-Hur	HIST/FICTN	Cardnl Gnt#GC-75, 1 pr '59	FINE		7.50
Wallace,	Lew	The Fair God [novel of conquest of Mexico]	HIST/FICTN	Popular Library, 1962	FINE		7.00
White,	T.H.	The Bestiary	NAT.SCIENC	Putnam/Capricorn, 1960	MINT		7.00
Wylie,	Philip	Generation of Vipers [controversial at the time]	CRITICISM	Cardnl Gnt#GC-62 2d pr,'59	NF		7.50
Wylie,	Philip	Opus 21	FICTION	Cardinal Giant #85, 1960	VG		5.00

I. GENERAL INTEREST PAPERBACKS - FICTION & NONFICTION

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	PRICE
Ballou,	Robert O.(Ed.)	The Portable World Bible [8 major religions]	RELIGIONvj	Penguin trdpb,1976[VINTGE]	VG+@	4.00
Balsiger/Sellie	David/Charles	The Lincoln Conspiracy [VINTAGE]	HIST/SPECU	Schick-Sunn 1st Ed pb,1977	FINE	4.00
Barry,	Dave	Homes and Other Blackholes	HUMOR	Fawcett 1st Ed,trdpb,1988	NF	6.00
Beck, Warren D.	& Ynez D.Haase	Historical Atlas of California	CALIF/HIST	Univ.Okl.Pr-lg.tr.pb 9X12	VG+	13.00
Breathed,	Berke	Penguin Dreams & Stranger Things [Bloom County]	HUMOR-vj	LtlBrown lg.trdpb, 1985	VF	8.00
Breathed,	Berke	Tales Too Ticklish to Tell [Bloom County]	HUMOR-vj	LtlBrown lg.tradpb, 1988	MINT	10.00
Brown,	Daniel Patrick	The Protectorate & the Northumberland Conspiracy	BR/HIST-vj	Golden West 2d pr, 1989	VF	2.50
Brown,	Daniel Patrick	The Tragedy of Libby & Andersonville Prison Camps	US/HIST-vj	Golden West 4th pr, 1988	VF	2.50
Clavell,	James	King Rat	WWII/FICTN	Dell 4th pr, 1976	MINT	4.00
Clavell,	James	Tai-Pan	ADVENTURE	Dell 7th pr, 1977	MINT	4.00
Crane,	Stephen	The Red Badge of Courage [Civil War Classic]	AM/LIT	Bantam Classic 7th pr,1985	NVG@	2.50
George,	Margaret	The Autobiography of Henry VIII	HIST/FICTN	Ballantine lg.trdpb, 1987	MINT	10.00
Greene,	Graham	Monsignor Quixote	FICTION	Pkt Bks/WSP ed, 1983	NF	3.00
Gregory,	Dick	Nigger-An Autobiog [VINTAGE]	BIOG-vj	Pocket Cardinal 10th, 1968	FR %	1.50
~~Haley,~~	~~Alex~~	~~Roots [VINTAGE]~~	~~HIST/FICTN~~	~~Dell 1st pr, 1977~~	~~MINT~~	~~4.00~~
Heilbroner,	Robert L.	The Worldly Philosophers Grt.Econ.Thinkrs [VINTGE]	ECONOMICS	Sim&Schust Touchstone,1976	MINT	5.00
Hemingway,	Ernest	The Old Man and the Sea [VINTAGE]	LITER-vj	Chas.Scribners pb,nd-1977?	NVG%	1.00
Lawrence,	D.H.	Four Short Novels [below]	BR/LIT-vj	Penguin Books, 1982	FINE	5.00
Lawrence,	D.H.	Four Short Novels: Love Among the Haystacks	BR.LIT-vj			
Lawrence,	D.H.	Four Short Novels: The Captain's Doll	BR.LIT-vj			
Lawrence,	D.H.	Four Short Novels: The Fox	BR.LIT-vj			
Lawrence,	D.H.	Four Short Novels: The Ladybird	BR.LIT-vj			
McManus,	Patrick F.	The Good Samaritan Strikes Again	HUMOR/FISH	H.Holt 1st Ed trdpb, 1992	VF	4.00
Mitchell,	Kirk	A.D. Anno Domini [from Vincenzo Labella film]	HIST/FICTN	Berkley, 1985	MINT	3.00
Morgan/Symmes,	Hal & Dan	Amazing 3-D [Printed in 3-D, incl orig glasses]	ENTRTAINvj	Little Brown 2d pr, 1983	FINE	25.00
Robinson,	James M. (Ed.)	The Nag Hammadi Library [new Gnostic script.trans]	RELIG/ARCH	Harper & Row trdpb, 1981	MINT	9.00
Schonfield,	Hugh [VINTAGE]	The Passover Plot [Religious speculation]	RELIGION	Bantam, 1967	GD @	2.00
Smith,	Henry Nash	Virgin Land [the American west] [VINTAGE]	US/HISTORY	Harvard trdpb, 3d pr, 1973	NF @	4.00
Solzhenitsyn,	Alexander	One Day in the Life of Ivan Denisovich	POL.FICTvj	Bantam Windstone ed, 1981	NF @	3.00
Steinbeck,	John	The Pearl	AM/LIT	Bantam, 1978	VF	3.00
Sussman,	Gerald	Not Quite TV GUIDE	HUMOR	Prince trdpb/Crown, 1983	NF	5.50
Sussman,	Gerald	Over-Extension University Bulletin	HUMOR	M.Evans trdpb, 1st,1982	VF	5.00
Tine,	Robert	Tucker-The Man & His Dream [from screenplay]	HIST/FICvj	Pocket Books orig, 1988	NF @	2.50

J. GENERAL INTEREST HARD-COVER BOOKS - FICTION & NONFICTION

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND	DW/BOOK DESCRIPT	PRICE
Agee,	James	A Death in the Family	FICTION	McDowell, c.1957	NVG	DW chipped,worn	5.00
Armory,	Cleveland	Compleat Cat [3 in 1 below]	WIMSY/HUMR	Black Dog & Leventhal, nd	MINT	DW Mint	10.00
Armory,	Cleveland	The Best Cat Ever [c.1993]	WIMSY/HUMR				
Armory,	Cleveland	The Cat Who Came for Christmas [c.1987]	WIMSY/HUMR				
Armory,	Cleveland	The Cat and the Curmudgeon [c.1990]	WIMSY/HUMR				
Barry,	Dave	Dave Barry Slept Here/A Sort of History of the U.S	HUMOR	Random House 1st Ed, 1989	MINT	DW Mint	7.50
Barry,	Dave	Dave Barry's Guide to Life	HUMOR	Wings Books ed, 1991	MINT	DW Mint	9.50
Barry,	Dave	Dave Barry's Only Travel Guide You'll Ever Need	HUMOR	Fawcett Col. 1st ed, 1991	MINT	DW Mint	9.50
Benchley,	Robert	The Best of Robert Benchley / Illos by Peter Arno	HUMOR	Avenel/Crown, 1983	MINT	DW Fine	8.00
Bermant/Weitzma	Chaim/Michael	Ebla [impact of archeology on Biblical history]	ARCHEOLOGY	Times Bks,1st US ed,c.1979	FINE	DW VG	12.00
Bishop,	Jim	The Day Christ Died	RELIG/HIST	Harper, c.1957 (libr.copy)	FINE	DW:F,plastic cov	4.00
Bottigheimer,	Karl S.	Ireland and the Irish/A Short History	HISTORY	Columbia Univ 1st Ed, 1982	MINT	DW Mint	10.00
Forster,	E.M.	Books [3 in 1 vol below]	FICTION	Gramercy ed, 1993	MINT	DW Mint	12.50
Forster,	E.M.	Howard's End [1910]	FICTION				
Forster,	E.M.	Room With a View, A [1908]	FICTION				
Forster,	E.M.	Where Angels Fear to Tread [1905]	FICTION				
Frank,	Harry Thomas	Discovering the Biblical World [Arch, Hist, Geog]	RELIG/HIST	Hammond ovsize 1st Ed,1975	MINT	DW sm.chip,scrat	27.00
Frend,	W.H.C.	The Rise of Christianity	RELIG/HIST	Fortress Press, 1984	MINT	DW Mint	22.00
Grant,	Michael	History of Rome	HISTORY	Scribners, 1978	MINT	DW Mint	11.00
Graves,	Robert	King Jesus	RELIG/FICT	Farrar... 5th pr, 1984	MINT	DW Mint	12.50
Graves,	Robert (trans)	I, Claudius [green embossed binding]	HIST/BIOG	Intl Collectors Lib,c.1961	MINT	publ w/o DW	9.50
Guerber,	H.A.	Middle Ages/Myths & Legends	HIST/LIT	Bracken Bks, London, 1986	MINT	DW Mint	14.00
Howard,	Donald R.	Chaucer: His Life, His Works, His World	HIST/LIT	Dutton 1st Ed., 1987	MINT	DW Mint	20.00
Kipling,Rudyard	Sel-J.Beecroft	A Selection of Stories & Poems [Two-volume set]	WORLD/LIT	Doubleday BC ed, 1956	VG	DW sm.tears,worn	13.00
Magnusson,	Magnus	Archaeology of the Bible	ARCHEOLOGY	Simon-Schuster BC ed, 1977	MINT	DW sm tear spine	9.50
Mailer,	Norman	Ancient Evenings	HIST/FICTN	Little Brown BC ed, c.1983	MINT	DW sm.wrinkle	8.00
Marsh,	Jean	The House of Eliott [Based on BBC TV series]	HIST/FICTN	St.Martin's Pr 1st US,1993	MINT	DW Mint	8.00
McCullough,	Colleen	Book Set: "The Masters of Rome" [1st four novels]	HIST/FICTN	Morrow 1stEd,1990-91,93,96	FINE	DW FINE	75.00
McCullough,	Colleen	Caesar's Women [#4 in Masters of Rome series]	HIST/FICTN	Morrow 1st Ed tr/papr 1996	FINE		15.00
McCullough,	Colleen	Fortune's Favorites [#3 in Masters of Rome series]	HIST/FICTN	Morrow 1st Ed, 1993	FINE	DW FINE	22.00
McCullough,	Colleen	The First Man in Rome [#1 in Masters of Rome ser.]	HIST/FICTN	Morrow 1st Ed., 1990	FINE	DW FINE	23.00
McCullough,	Colleen	The Grass Crown [#2 in Masters of Rome series]	HIST/FICTN	Morrow 1st Ed., 1991	FINE	DW FINE	22.00
McGroarty,	John S.	California: Its History & Romance [Frntpc missing]	HISTORY	Grafton 1st Ed.,inscrb1913	GOOD	publ w/o DW	12.00
McGroarty,	John S.	California: Its History & Romance [pebbled bindg]	HISTORY	Grafton, 12th ed, 1928	NF	publ w/o DW	12.00
Meeks,	Wayne A.	First Urban Christians, The / Soc World of St.Paul	RELIG/HIST	Yale University Pr, 1983	MINT	DW Mint	9.00

AUTHOR	FIRST NAME	BOOK TITLE	CATEGORY	PUBLISHER/EDITION/YEAR	COND DW/BOOK DESCRIPT	PRICE
Parrinder,	Geoffrey	World Religions From Ancient History to Present	RELIG/HIST	Facts-on-File USA ed, 1983	MINT DW edge chips	20.00
Penman,	Sharon Kay	Both Novels (below)	HIST/FICTN			20.00
Penman,	Sharon Kay	Falls the Shadow (Sequel to "Here Be Dragons")	HIST/FICTN	Henry Holt 1st Ed., 1988	MINT DW Mint	12.00
Penman,	Sharon Kay	Here Be Dragons	HIST/FICTN	Holt/Rinehart BC ed, c1985	FINE DW NF	10.00
Robinson,	James M. (Ed.)	The Nag Hammadi Library [new Gnostic script.trans]	RELIG/ARCH	Harper & Row, cloth, 1988	MINT DW Mint	27.00
Silberman,	Neil Asher	Digging for God & Country/ Explor & Arch Holy Land	ARCHEOLOGY	Knopf 1st Ed., 1982	MINT DW Mint	15.00
~~Weens,~~	~~John Edward~~	~~A Weekend in September [The Galveston Storm 1900]~~	~~US/HIST-vj~~	~~Henry Holt 1st Ed, 1957~~	~~FINE DW well worn~~	~~12.00~~
West,	Morris	Books - 3 in 1 vol / Vatican Trilogy (list below)	RELIG/FICT	Wings ed, 1993	FINE DW Fine	15.00
West,	Morris	Lazarus [c.1990]	RELIG/FICT			
West,	Morris	The Clowns of God [c.1981]	RELIG/FICT			
West,	Morris	The Shoes of the Fisherman [c.1963]	RELIG/FICT			
Wilken,	Robert L.	The Christians as the Romans Saw Them	RELIG/HIST	Yale University Pr, 1984	MINT DW Mint	6.00

EXCERPTS FROM MY "WISH BOOK" (WANT LIST)

As a collector AND READER (not a dealer) I'm not particularly seeking top-grade, resaleable copies. My requirements: magazines MUST have at least a Front Cover (Canon/Xerox repro OK) and books MUST have both covers (and preferably a DW for HCs). All items MUST be complete, NOT BRITTLE, and not greatly tattered. I've found many dealers' VG+, VG, NVG and (sometimes) GOOD condition ratings acceptable. When possible, I prefer to TRADE and will negotiate generously. Items marked with asterisks (*) are MY FIRST PRIORITY.

Out of Date

✓ ~~* *A. Merritt's Fantasy Magazine* 1949: 12 (#1)~~
✓ ~~* *Analog* 1960: 11~~
Astounding Stories Yearbook #2
* *Astounding Stories/SF* Selected Issues:1930-36, Aug 1939, 1941 through 1960 (selected)
* *Amazing Stories* Selected 1926-29, 11/31, 1933-1939 (selected)
* *Amaz.Stor.Quartly* Selected 1928-1931
Amaz.Detective/Scientific Detect. All 10 (1930)
Captain Zero 1950: 1, 3
* *Fantastic* ~~1953: Jan-Feb~~ and 1954: 12
Fantasy Book (Wm.H. Crawford's 1947-51 opus -) #1, #3, #4, #5, #6, and #8
* *Galaxy Novels* (Digest -) ~~#16, #17, #23~~, #24, #25, #26, #29, and #31;(Beacon pb -) #32, #33, #34, #36, and #37
* *Golden Fleece* 1939: 1
* *Famous Fantastic Mysteries* Selected 1940-47, 6/48, 2 & 6/49, 1951-53 (selected)
* *Fantastic Novels* Selected 1940-49, 11/50, 1/51

* *Mag of F & SF* Selected 1950-1960, Oct.anniv.iss.
* *Galaxy SF Mag* 1952, Selected 1954-1961, Oct. anniv.issues (selected)
Space Stories 1953: 4, 6
* *Planet Stories* Selected 1939-1955
Strangest Stories Ever Told 1970: Summer
* *Tales of the Frightened* 1957: 8 (#2)
Unknown Worlds of Science Fiction ("COMIC") - 1975: 3, 9, 11 [& "Special #1 Issue" if different than "regular" No.1 issue ?????]
✓ ~~* *Vanguard Science Fiction* 1958: 6 (#1)~~
Wonder Stories Group:
* *Air Wonder* Selected 1929-1930
* *Science Wonder* Selected 1929-30
* *Sci.Wonder Qtly.* Wntr, Spr 1930
* *Wonder Stories* Selected 1930-31, 1933-36
* *Wond.Stor.Qtly.* All 11 1930-1933 issues
Thrill.Wonder.Stor. Selected 1936-1955
* *Wonder Stories* (Popular Lib reviv) 1963: 4 (#2)
✓ ~~* *Worlds of Fantasy* (Galaxy/U.S.A.) 1968: 9 (#1)~~

SEEKING SF&F HISTORY

If someone has a copy of the following for trade or sale, please contact me. Ashley, Michael *History of the Science Fiction Magazines*, Vol.4 in trade PB size.

. . . .

PAPERBACK BOOKS — ADDENDA FOR THIS 2nd PRINTING (SUMMER 1997)

Groff Conklin, Ed.: *5 Unearthly Visions* Fawcett Gold Medal 1st, 1967, GOOD (Vintage) $2.00; *12 Great Classics of Science Fiction* - "Undiscovered Gems" Fawcett Gold Medal Orig, 1963, corn.crease, NVG (Vintage) $3.50; Robert Hoskins, Ed.: *Strange Tomorrows - short novels* Lancer Orig, 1972 (Vintage) FAIR-GOOD $1.50; Leo Margulies, Ed.: *3 From Out There - 3 "novels"* Fawcett Crest Orig, 1959 (Vintage), GOOD-FAIR $1.50. // O'HARA, JOHN *Collected Stories...* Gen(Fict) Random Hs. TrdPB, c.1984, corn.bent, VG $2.50.

Also Want: "The Free Enterprise Patriot" by John Rickey, Research/Development, Chicago 1964. ANY EDITION

Anthro-Science-Fiction

by Vince Nowell

IN THE SPIRIT OF Sir Arthur Conan Doyle's *The Lost World*, readers are now seeing protohuman or hominid versions. To put it in the crude vernacular, "cavemen-still-live-among-us novels abound.

The 1996-97 tales that have come to my attention are Mark Canter's *Ember From the Sun* (Delacorte), Petru Popescu's *Almost Adam* (Wm.Morrow/Avon),and John Darnton's *Neanderthal* (Random House).

These fall into a broader category of stories that science fiction writers have treated for years, *viz.*, anthropology, or more precisely, paleoanthropology. This kind of tale has always grabbed my attention.

The first speculative-fiction anthropological story I ever read was H.G. Wells' "A Story of the Stone Age." In a gross compression of time, his Cro-Magnon-like characters discover, by reasoning, fundamental tools and processes that underlie human culture, hence, civilization.

Jack London did something similar in a story entitled "Before Adam" that is not in my collection. But his "first man" (and woman) is dealt with more melodramatically. As in Wells' tale, the characters also lay the foundations for the subsequent presence of *homo sapiens sapiens*.

Ken Follett, introduced a genealogical succession of characters beginning in Great Britain's paleolithic onset in *Pillars of the Earth* (historical fiction, not science fiction). The descendants of these early humans continue to inhabit the area around Stonehenge well into the time of Elizabeth I in the book.

THE STORIES THAT have truly caught my attention, and constitute some of the better speculation about early man and pre-man, are by such writers as Michael Bishop, Harry Turtledove, Jean Auel, and William Golding. (Pardon the use of the gender-slanted "man/men," but doing so helps the writing flow better and conforms to accepted paleoanthropological practice, politically correct or not. (Refer to the February 1997 issue of *National Geographic*.)

MICHAEL BISHOP's ***NO ENEMY BUT TIME*** is one of the best speculations on the nature, i.e., the mentality, of proto-hominids. He uses time travel to place his lead character, John Monegal, in central Africa millions of years ago, in a setting right out of the Leakey journals. The meeting of modern, *h.sapiens sapiens* culture represented by Monegal and that of the *australopithecines* among whom Monegal finds himself, is written believably and sensitively. No "caveman" grunt-and-pull-females-around-by-the-hair stuff here! It's a more serious, more entertaining, work than his novel about a leftover specimen of *homo habilis* who shows up in the protagonist's backyard tree one morning, rapidly learns English, and becomes a major artist.

WHICH BRINGS UP the theme of the plunging of early man/prehuman characters into a modern setting. **HARRY TURTLEDOVE** does just that in ***A DIFFERENT FLESH***. Alternate history is the mechanism for this, which he has developed to new heights in speculative fiction. Yet I found Mr. Turtledove's "sims" (for "simians"?) difficult to accept at times; he overdoes the "noble savage" theme. His book moves inexorably toward the idea of bad White intruders vs the besieged native inhabitants of the New World. Indians and colonists all over again. This time, however, the Native-Americans get a somewhat better break.

An interesting story, the revival of *homo sapiens neanderthalensis*, is **MARK CANTER's** ***EMBER FROM THE SUN***. Canter, professional journalist-turned-fiction-writer, displays a remarkable knowledge of human biology and medicine. Technically, much of his book is very solid. His character development and speculation about the physiology of Neanderthals are weaker aspects of the novel, however.

A far better treatment, with evidence of painstaking research, is **JOHN DARNTON's** ***NEANDERTHAL***. This "spy thriller" combined with sf about the discovery of *H. Neanderthal* surviving into modern times is well written, even if a few incidents stretch credibility. He delves deeply into the *hominid* psyche, offering acceptable ideas re psychology and parapsychology.

PETRU POPESCU's ***ALMOST ADAM*** offers a similar "lost world" treatment, *australopithecus* in modern Africa. Popescue combines mystery, high adventure, political commentary, anthropological insight, and academic competitiveness all in one book. The hominid nearly becomes background. An interesting mental romp.

The best treatment of the "near-human-among-us" concept I have ever read is Vercors' (Jean Bruller) *You Shall Know Them*. (My copy is from Little, Brown & Co., 1953.) Vercors explores the question "what is man?" via the idea of the discovery of "ape-men" in the 20th century. This remarkable work by the former French Resistance leader, possibly inspired by recent Nazi ideology, combines philosophy, theology, law, and anthropology in a masterful blend of story-telling. If it has not been reprinted, it should be.

MY PREFERENCE STILL RUNS to those stories that try to describe for us human moderns what life (and people) were like a half-million and more years ago, à la Wells and London. For research, I'll give an award to Jean Auel's *The Clan of the Cave Bear*, but not its exhausting sequels. My close-second prize goes to J.H. Rosny's *Quest for Fire*, a book that became an even better motion picture. My only quarrel in both is the assumption of inherent brutishness in *Neanderthals*. Ms.Auel offsets that somewhat by incorporating a degree of esp powers among her otherwise virtually mute people, an idea used in Darnton's, and (especially) Canter's books, and hinted at in Popescue.

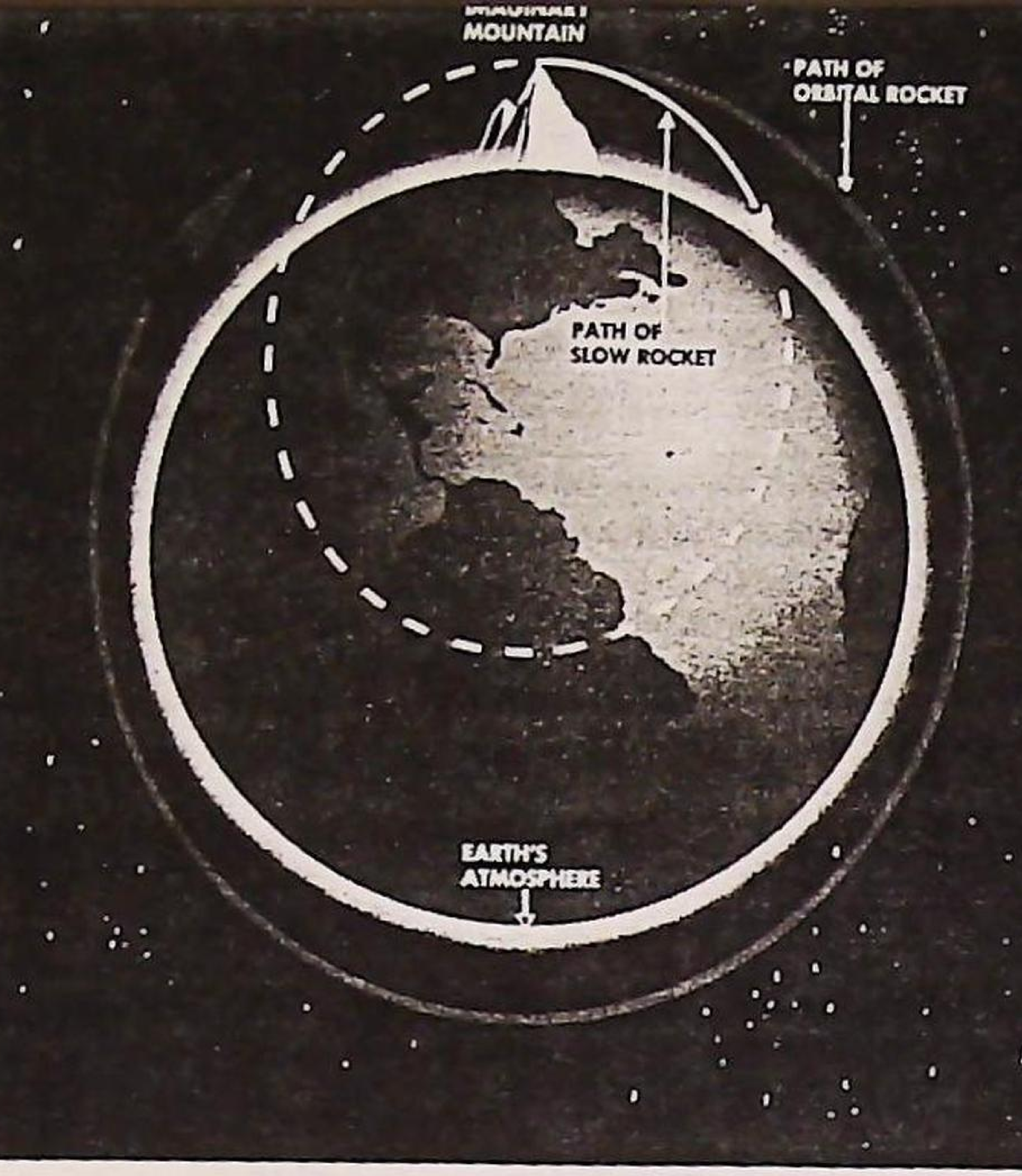
My Grand Prize Award, however, goes to William Golding for *The Inheritors*. His verbal portrait of *Neanderthals* is probably the most credible I have ever encountered. Golding's people are both savage and lovable, rudimentary and innovative, rough survivalists and fearful spiritualists, lustful and fun-loving. In short, they are just like us! (My personal view is that *Neanderthal* DNA survives to this day in the human gene pool.)

Via Golding we can understand them, sympathize with them, be concerned for their future, and share their joys and griefs. He carefully and thoughtfully adapted the "human element" into an alien culture, presenting it to us as revelation. That's great writing.

- -

AUTHORS *and* ***TITLES*** *in* **bold**/***bold italics*** *are available in the Science Fiction PB and HC lists in this issue.*

MAGAZINE: POPULAR SCIENCE
DATE: MAY 1949
VOLUME 154, NUMBER 5
PAGES: 106-112
ARTICLE: IS U.S. BUILDING A NEW MOON?
AUTHOR: WILLY LEY



Imaginary mountain, towering high above earth's atmosphere, represents point in space where orbital rocket would be launched. Any slow-moving rocket fired from top of this mountain would eventually strike the earth since it would fall faster than the earth's surface would curve away beneath it. When velocity is 5 miles per second, however, distance rocket falls exactly equals distance earth's surface curves away—eight inches every mile. Thus, though rocket keeps falling toward the earth, the earth keeps bending away from it, and it can never land. Broken line shows how path of slow rocket, if continued would form ellipse; path of orbital rocket would form ellipse in same way

er" to spin around the earth like the moon.

A 10,000-m.p.h. space ship might fly around the world, but it would not be, and could never become, a genuine satellite. Even if it were driven by atomic energy, such a go-cart would eventually have to be refueled. The moon doesn't need any fuel. Nor could a 10,000-m.p.h. craft ever slip out of the grip of the earth's gravity. To do that, you'd have to go over 25,000 m.p.h.

Before some Tom, Dick, or Harry takes off like a character in fiction, however, a second moon is likely to become one of the many ramparts watched by America's armed forces.

It won't have anybody in it.

It will never need more fuel.

It will be much smaller, closer, and faster than the moon that makes men croon, but it will be bound just as tightly to Mother Earth's apron strings.

How soon a moon like this will hang overhead depends pretty largely on how much money is spent how fast. I believe that without making a noticeable dent in the national budget an orbiter of this type could be planted in the sky within 10 or 12 years.

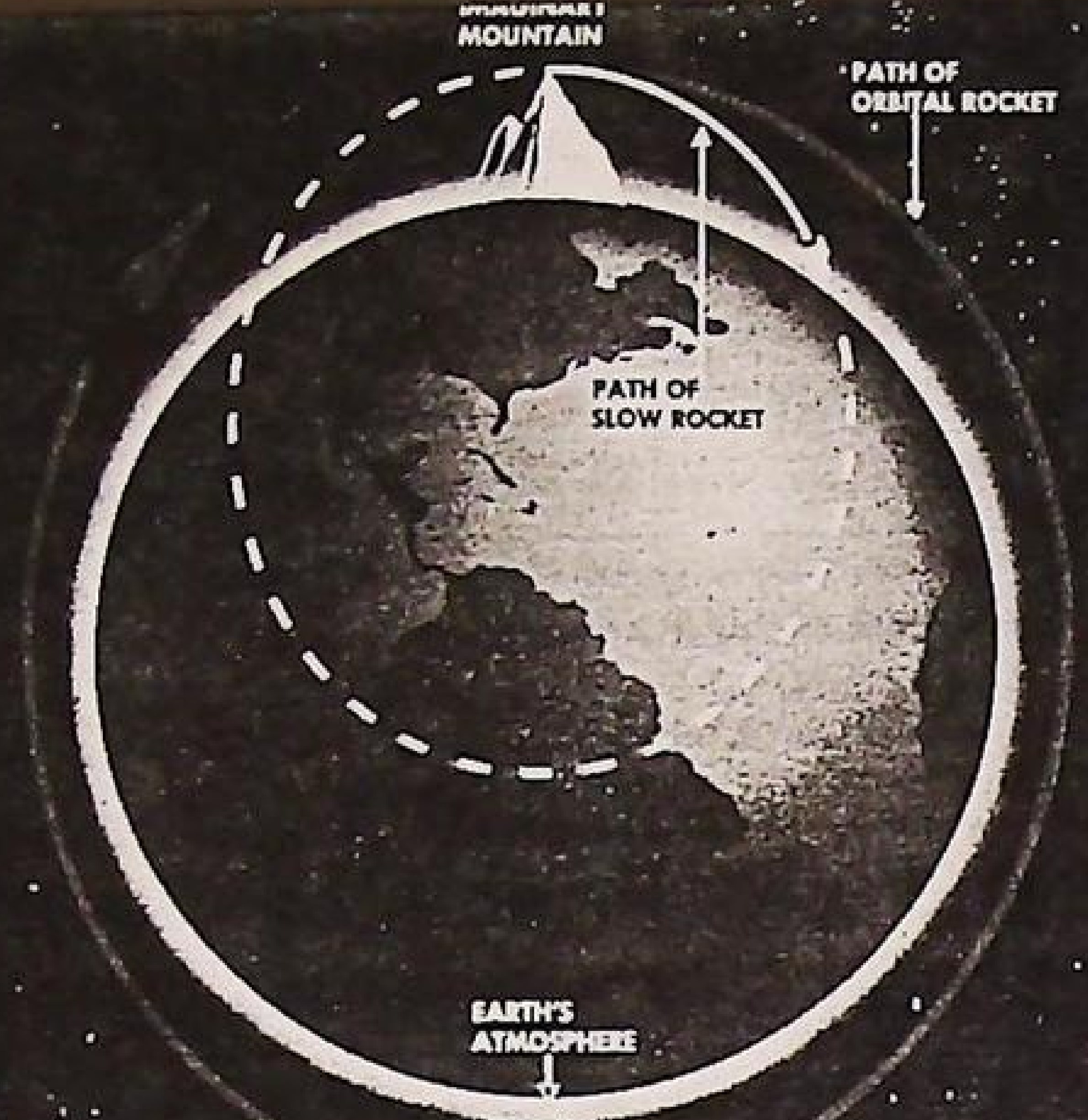
Once a projectile was out in space, a shove of 18,000 m.p.h. would be enough to keep it going around and around like the moon. That velocity could be attained with "step rockets," which are simply two-in-one or three-in-one rockets.

Such rockets are the only known kind that could make full use of a testing range 3,000 miles long. And that, you cannot be criticized for noting, is the length of the range that U. S. defense chiefs now want.

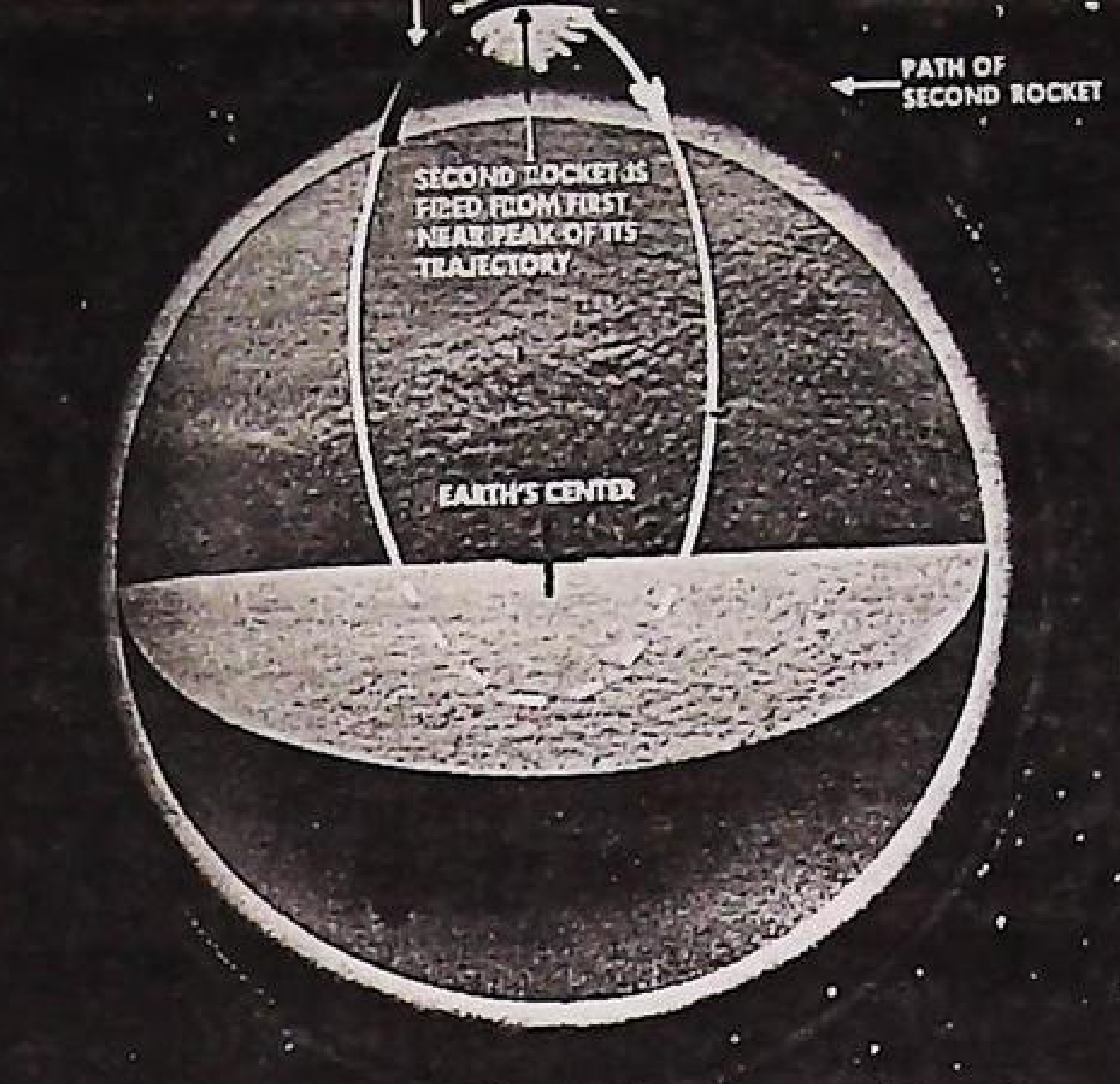
Two-Step Rocket Tried

Much research along this line has already been done (see "Going Up for Keeps," PS, March '47, p. 66). Late last February, the Army set off a two-step rocket at White Sands, N. Mex., that reached an altitude of 250 miles and a velocity of 5,000 miles an hour, both record achievements. Much more research, however, remains to be done.

The sketches on pages 106 and 107 show how a three-step rocket might plant a small manless moon in the sky. The sketches on these pages show why a velocity of 18,000 m.p.h., which is 5 miles per second, would keep it up until doomsday if nothing knocked it off its course.



Imaginary mountain, towering high above earth's atmosphere, represents point in space where orbital rocket would be launched. Any slow-moving rocket fired from top of this mountain would eventually strike the earth since it would fall faster than the earth's surface would curve away beneath it. When velocity is 5 miles per second, however, distance rocket falls exactly equals distance earth's surface curves away—eight inches every mile. Thus, though rocket keeps falling toward the earth, the earth keeps bending away from it, and it can never land. Broken line shows how path of slow rocket, if continued, would form ellipse; path of orbital rocket would form ellipse in same way


PATH OF SECOND ROCKET
SECOND ROCKET IS FIRED FROM FIRST NEAR PEAK OF ITS TRAJECTORY
EARTH'S CENTER

Using two rockets, one fired from the other, would accomplish sam thing as launching single rocket fron imaginary mountain on previou page. First rocket, fired nea straight up, would carry to well ab earth's atmosphere. Then secon rocket, fired from first one near pea of its trajectory, would be placed i path almost at right angle to earth' radius. This rocket, traveling at miles per second, would then ente permanent orbit around earth whil first rocket dropped back. Actual a tempt would probably require 3-ste rocket, but principle would be th same. Note that two rockets' ellip cal paths would both have earth center as one of their two focal poin

er" to spin around the earth like the moon.

A 10,000-m.p.h. space ship might fly around the world, but it would not be, and could never become, a genuine satellite. Even if it were driven by atomic energy, such a go-cart would eventually have to be refueled. The moon doesn't need any fuel. Nor could a 10,000-m.p.h. craft ever slip out of the grip of the earth's gravity. To do that, you'd have to go over 25,000 m.p.h.

Before some Tom, Dick, or Harry takes off like a character in fiction, however, a second moon is likely to become one of the many ramparts watched by America's armed forces.

It won't have anybody in it.

It will never need more fuel.

It will be much smaller, closer, and faster than the moon that makes men croon, but it will be bound just as tightly to Mother Earth's apron strings.

How soon a moon like this will hang overhead depends pretty largely on how much money is spent how fast. I believe that without making a noticeable dent in the national budget an orbiter of this type could be planted in the sky within 10 or 12 years.

Once a projectile was out in space, a shove of 18,000 m.p.h. would be enough to keep it going around and around like the moon. That velocity could be attained with "step rockets," which are simply two-in-one or three-in-one rockets.

Such rockets are the only known kind that could make full use of a testing range 3,000 miles long. And that, you cannot be criticized for noting, is the length of the range that U. S. defense chiefs now want.

Two-Step Rocket Tried

Much research along this line has already been done (see "Going Up for Keeps," PS, March '47, p. 66). Late last February, the Army set off a two-step rocket at White Sands, N. Mex., that reached an altitude of 250 miles and a velocity of 5,000 miles an hour, both record achievements. Much more research, however, remains to be done.

The sketches on pages 106 and 107 show how a three-step rocket might plant a small manless moon in the sky. The sketches on these pages show why a velocity of 18,000 m.p.h., which is 5 miles per second, would keep it up until doomsday if nothing knocked it off its course.

A cargo of instruments permanently placed above the blanket of air in which we dwell could tell us a lot of things that no one knows now. If, say, the instruments were to weigh 200 lb. (which is a lot of instruments nowadays), and the cart in which they were placed were to weigh 800 lb., they could be accelerated to 18,000 m.p.h. by a step rocket weighing a trifle less than 119 short tons.

This could be done with known fuels. How the total weight would be divided among the three parts of the rocket is indicated alongside the drawing on page 107. I have assumed, in these computations, that in each step the ratio between the total fueled weight and the combined hull and payload weight would be 3.5 to 1 and that the velocity of the exhaust blast would be 7,500 feet per second. These are plausible assumptions, and my conclusions are based on Newton's third law of motion.

The rocket the artist has pictured would be 120 feet tall, about the height of a 10- or 11-story building.

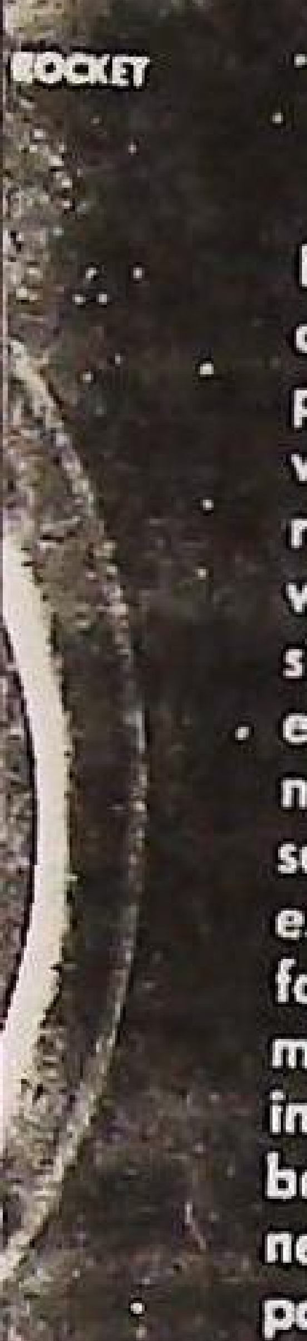
Such a monster does not seem fantastic when you recall the disclosures since the war. A V-2 rocket is 46 feet high and weighs 15 short tons when it takes off. The N were found, however, to have a far bi job in the works. Intended to cro Atlantic and bombard us, it was to two-step rocket with a take-off weig 93 short tons (PS, Oct. '47 p. 108).

The Germans knew that step ro would actually work. They used a s three-step, solid-fuel rocket called the R bote ("Messenger from the Rhine") for range bombardment work during the for Antwerp. That American experts have picked the Germans' brains are wo on booster rockets is no secret (see p.

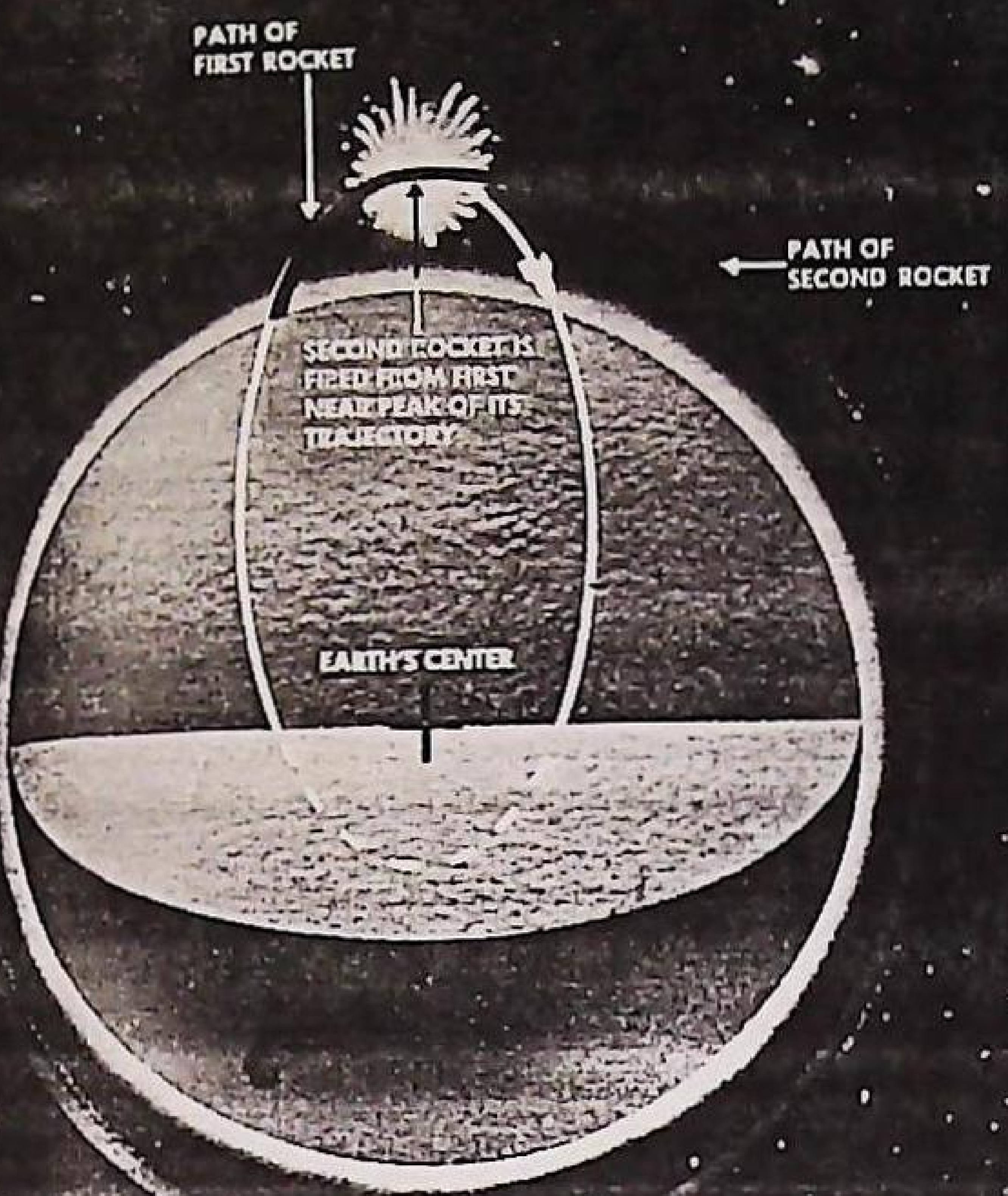
To an uninformed bystander, a thre rocket capable of delivering a half-ton might look like a single one. Since th inner rockets would operate above t mosphere, they need not be stream They could be fitted into the hull of t big booster without a cubic inch wast

Such a mighty missile's ascent begin rather slowly. The air would less resistance as it climbed and it gain speed faster. At 30 miles up, it be going about a mile a second.

To get it out of the dense, lower



Imaginary mountain, towering h above earth's atmosphere, repre point in space where orbital roc would be launched. Any slow-mo rocket fired from top of this mounta would eventually strike the eart since it would fall faster than th earth's surface would curve away b neath it. When velocity is 5 miles p second, however, distance rocket fa exactly equals distance earth's su face curves away—eight inches ever mile. Thus, though rocket keeps fal ing toward the earth, the earth keeps bending away from it, and it can never land. Broken line shows how path of slow rocket, if continued would form ellipse; path of orbital rocket would form ellipse in same way.


PATH OF FIRST ROCKET
PATH OF SECOND ROCKET
SECOND ROCKET IS FIRED FROM FIRST NEAR PEAK OF ITS TRAJECTORY
EARTH'S CENTER

Using two rockets, one fired from the other, would accomplish same thing as launching single rocket from imaginary mountain on previous page. First rocket, fired nearly straight up, would carry to well above earth's atmosphere. Then second rocket, fired from first one near peak of its trajectory, would be placed in path almost at right angle to earth's radius. This rocket, traveling at 5 miles per second, would then enter permanent orbit around earth while first rocket dropped back. Actual attempt would probably require 3-step rocket, but principle would be the same. Note that two rockets' elliptical paths would both have earth's center as one of their two focal points.

ove of 18,000 m.p.h. would be enough to ep it going around and around like the on. That velocity could be attained with ep rockets," which are simply two-in-one three-in-one rockets.

Such rockets are the only known kind that ld make full use of a testing range 3,000 es long. And that, you cannot be crit ed for noting, is the length of the range t U. S. defense chiefs now want.

Two-Step Rocket Tried

Iuch research along this line has already n done (see "Going Up for Keeps," PS, rch '47, p. 66). Late last February, the y set off a two-step rocket at White ds, N. Mex., that reached an altitude of miles and a velocity of 5,000 miles an r, both record achievements. Much more arch, however, remains to be done.

he sketches on pages 106 and 107 show a three-step rocket might plant a small, less moon in the sky. The sketches on e pages show why a velocity of 18,000 h., which is 5 miles per second, would it up until doomsday if nothing ked it off its course.

A cargo of instruments permanently placed above the blanket of air in which we dwell could tell us a lot of things that no one knows now. If, say, the instruments were to weigh 200 lb. (which is a lot of instruments nowadays), and the cart in which they were placed were to weigh 800 lb., they could be accelerated to 18,000 m.p.h. by a step rocket weighing a trifle less than 119 short tons.

This could be done with known fuels. How the total weight would be divided among the three parts of the rocket is indicated alongside the drawing on page 107. I have assumed, in these computations, that in each step the ratio between the total fueled weight and the combined hull and payload weight would be 3.5 to 1 and that the velocity of the exhaust blast would be 7,500 feet per second. These are plausible assumptions, and my conclusions are based on Newton's third law of motion.

The rocket the artist has pictured would be 120 feet tall, about the height of a 10- or 11-story building.

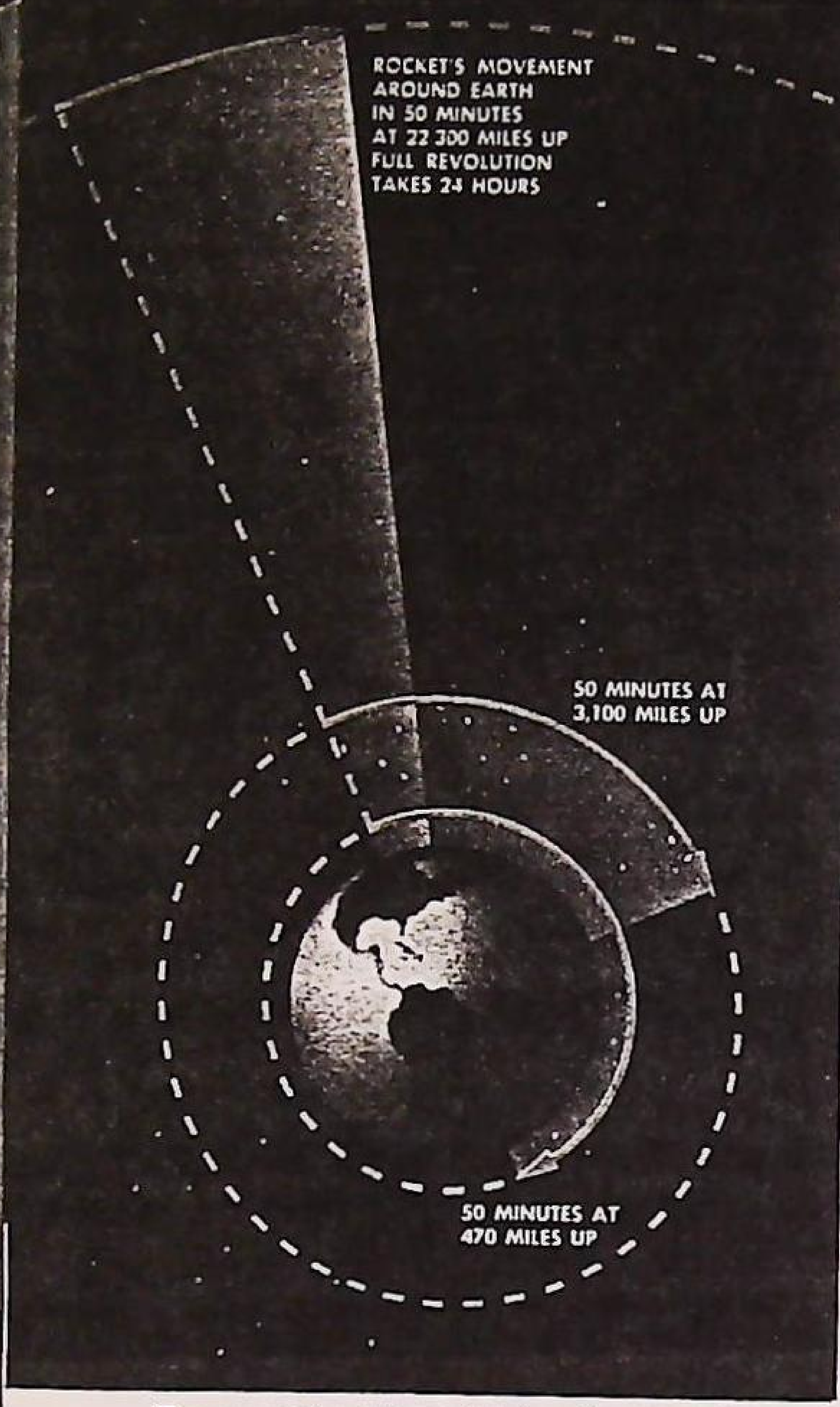
Such a monster does not seem fantastic when you recall the disclosures since the war. A V-2 rocket is 46 feet high and weighs 15 short tons when it takes off. The Nazis were found, however, to have a far bigger job in the works. Intended to cross the Atlantic and bombard us, it was to be a two-step rocket with a take-off weight of 93 short tons (PS, Oct. '47 p. 108).

The Germans knew that step rockets would actually work. They used a small, three-step, solid-fuel rocket called the Rheinbote ("Messenger from the Rhine") for long-range bombardment work during the battle for Antwerp. That American experts who have picked the Germans' brains are working on booster rockets is no secret (see p. 116).

To an uninformed bystander, a three-step rocket capable of delivering a half-ton moon might look like a single one. Since the two inner rockets would operate above the atmosphere, they need not be streamlined. They could be fitted into the hull of the first big booster without a cubic inch wasted.

Such a mighty missile's ascent would begin rather slowly. The air would offer less resistance as it climbed and it would gain speed faster. At 30 miles up, it should be going about a mile a second.

To get it out of the dense, lower atmos-


ROCKET'S MOVEMENT AROUND EARTH IN 50 MINUTES AT 22,300 MILES UP FULL REVOLUTION TAKES 24 HOURS
50 MINUTES AT 3,100 MILES UP
50 MINUTES AT 470 MILES UP

Time required for orbital rocket to make complete revolution about earth depends only on distance away, which determines how far it must go to get around. Drawing above shows orbiter's movement at three different altitudes. At 22,300 miles, rocket would take 24 hours to complete full revolution and would thus appear fixed over earth. At 3,100 miles, it would require 200 minutes, at 470 miles, only 100 minutes.

phere as quickly as possible, the rocket probably would be shot straight up. Then the trajectory could be slowly tilted. The deviation from a vertical path might not be more that 15° during the first step. This tilting from the vertical might increase during Step 2 and continue to do so in the final step until the rocket traveled along a line at a right angle to the radius of the earth during the last few seconds of its fuel's burning time.

But for the resistance of the air when the rocket first left the earth, it should be going 5 1/3 miles per second then. That's over a third of a mile per second faster than necessary, but much of this excess would have been lost while the rocket was passing through the atmosphere.

At a velocity of 5 miles per second, the rocket's directional inertia—the tendency to keep on a straight path—would combine with the force of gravity—tending to pull it earthward—to set it on a curving path around the earth. These forces of inertia and gravity keep the moon in its orbit and the planets in theirs, and they would keep this scooter full of instruments circling the world in a similar orbit.

The trajectory of every long-range or high-altitude rocket is an ellipse, and in every case one of the two focal points of the ellipse coincides with the center of the earth. The orbiter would be no exception. Its orbit would be an ellipse, but this ellipse might be so short and fat that in a small drawing it would look like a circle.

The time required for a complete revolution around the earth would be governed by a single factor: the new "moon's" distance from the earth. The farther it is from us, the longer it will take to go around.

Choose Your Orbit

If the distance from the ground were 470 miles (probably the minimum if we want to be sure to avoid even the last faint traces of air resistance), each complete revolution around the earth would take 100 minutes. This has the interesting result that the orbiter, when observed as a star, would "rise" in the West and "set" in the East. (It is assumed that it will be launched so that it would circle in the same direction as the earth rotates.) If its orbit were in the plane of the equator the rocket satellite could not be seen at all from higher northern and southern latitudes because the bulk of the earth would be in the way of the observer.

If the "orbiter" were to be placed 22,300 miles from the earth's surface, it would neither "rise" nor "set" because it would need just 24 hours for one revolution and therefore seem to stand still over one spot. While this might be amusing, the scientists would probably prefer to have their sky wagon move with respect to the ground.

It also would be advisable for several reasons to have the rocket closer than 22,300 miles out, the limited range of the telemetering instruments being one of them.

One of the many mysteries that the instruments could clear up is the temperature the orbiter itself would assume. Space itself, being empty, cannot have a temperature, but

erything material put into space will
ame one, since it will receive radiat
from the sun and radiate energy in t
How much will be absorbed and how m
will be re-radiated will depend on the
biter's surface smoothness, its heat con
tivity, its color, and many other factors.
Another interesting phenomenon woul
the drop in temperature when the or
entered the shadow of the earth, as it w
once during every revolution. Knowl
of this temperature fluctuation would
great interest to designers of long-range
siles that might take off at night in the ea
shadow and then leave it, or vice versa

Would Aid Solar Research

The instruments on the new space
could also relay a complete spectrum
sun. Spectra taken on the ground lack
sections that are cut out by the atmos
More complete spectra have been obt
by means of high-altitude rockets, but
rockets stay at a high altitude for only
short time, and their attitude at peak al
cannot even be guessed in advance.
Another item of solar research the
could help explain is sunspot activity.
tists suspect that clouds of ionized hy
gas from the sun wander through spac
orbiter's instruments could provide
information about them.
It might also be possible to equ
new moon with an instrument to sen
special signal if the rocket should be
a meteorite. That would settle, once
all, the perennial question of the pro
of getting your skull smashed by a
when you stick your head out of the
atmosphere.
Such an instrument probably woul
set off by the impact of individual
of cosmic dust, but in time these
change the temperature of the ro
reducing its light-reflecting power.
effect should be very strong, whic
likely, it could even reduce the
visual brightness.
To send findings back to the gro
instruments would need a source of
some sort. Batteries might not l
enough. It might be possible, how
obtain the necessary power from th
of radioactive substances in a man
if developed, would certainly be to
Perhaps the sun's energy could
for this purpose. It should be possi
vise thermoelements that, when h

st while the rocket was passing
the atmosphere.
elocity of 5 miles per second, the
directional inertia—the tendency to
a straight path—would combine
force of gravity—tending to pull it
d—to set it on a curving path around
. These forces of inertia and gravity
moon in its orbit and the planets
and they would keep this scooter
struments circling the world in a
rbit.

rajectory of every long-range or
ude rocket is an ellipse, and in
se one of the two focal points of the
incides with the center of the earth.
iter would be no exception. Its
uld be an ellipse, but this ellipse
so short and fat that in a small
it would look like a circle.

me required for a complete revolu-
nd the earth would be governed by
factor: the new "moon's" distance
earth. The farther it is from us, the
will take to go around.

Choose Your Orbit

distance from the ground were 470
robably the minimum if we want to
o avoid even the last faint traces of
tance), each complete revolution
he earth would take 100 minutes.
the interesting result that the or-
en observed as a star, would "rise"
est and "set" in the East. (It is as-
hat it will be launched so that it
rcle in the same direction as the
ates.) If its orbit were in the plane
uator the rocket satellite could not
at all from higher northern and
latitudes because the bulk of the
uld be in the way of the observer.
"orbiter" were to be placed 22,300
om the earth's surface, it would
"rise" nor "set" because it would
st 24 hours for one revolution and
seem to stand still over one spot.
is might be amusing, the scientists
probably prefer to have their sky
move with respect to the ground.
o would be advisable for several
o have the rocket closer than 22,300
t, the limited range of the telemeter
ruments being one of them.

of the many mysteries that the in-
ts could clear up is the temperature
ter itself would assume. Space itself,
npty, cannot have a temperature, but

everything material put into space will assume one, since it will receive radiations from the sun and radiate energy in turn. How much will be absorbed and how much will be re-radiated will depend on the orbiter's surface smoothness, its heat conductivity, its color, and many other factors.

Another interesting phenomenon would be the drop in temperature when the orbiter entered the shadow of the earth, as it would once during every revolution. Knowledge of this temperature fluctuation would be of great interest to designers of long-range missiles that might take off at night in the earth's shadow and then leave it, or vice versa.

Would Aid Solar Research

The instruments on the new space sled could also relay a complete spectrum of the sun. Spectra taken on the ground lack large sections that are cut out by the atmosphere. More complete spectra have been obtained by means of high-altitude rockets, but these rockets stay at a high altitude for only a very short time, and their attitude at peak altitude cannot even be guessed in advance.

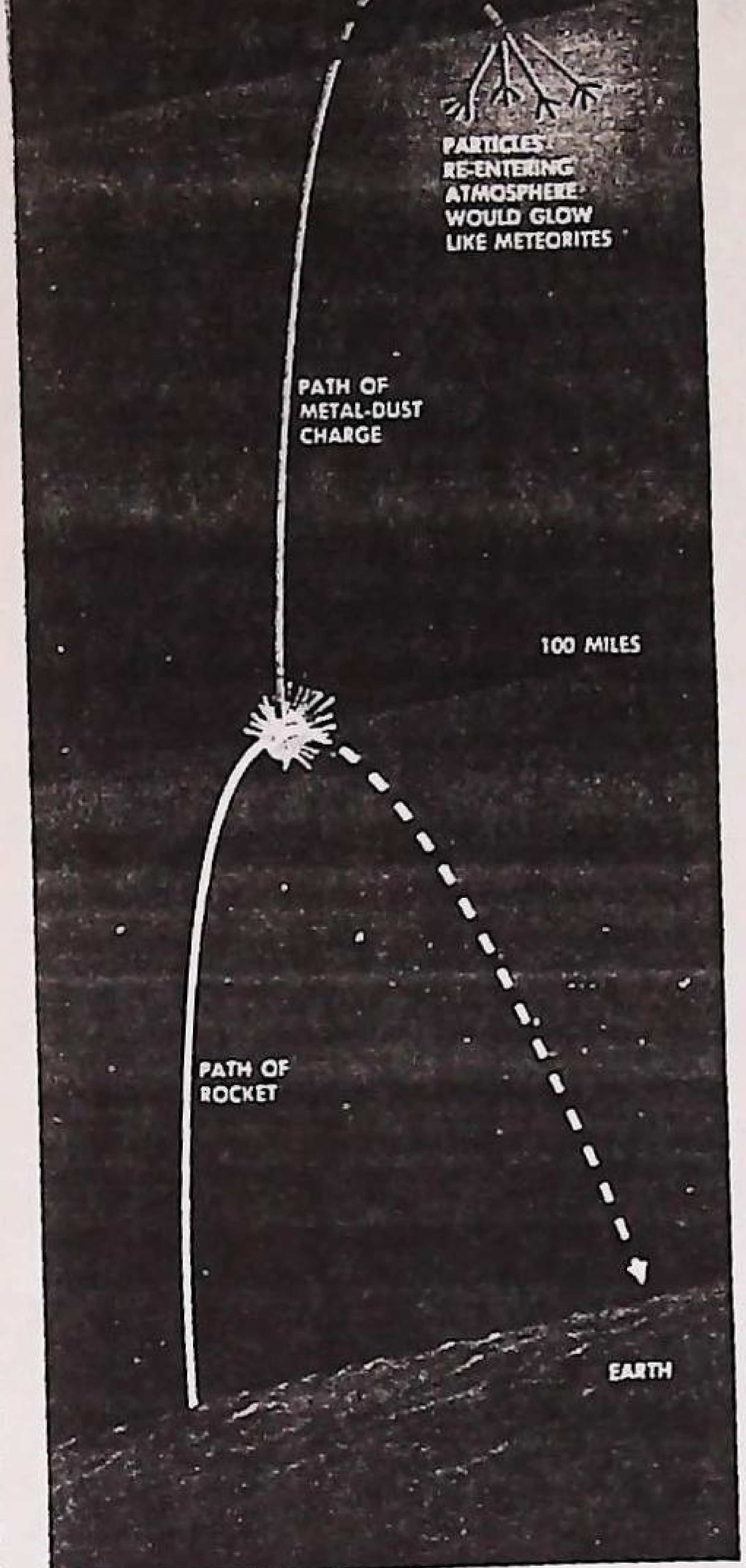
Another item of solar research the orbiter could help explain is sunspot activity. Scientists suspect that clouds of ionized hydrogen gas from the sun wander through space. The orbiter's instruments could provide definite information about them.

It might also be possible to equip the new moon with an instrument to send out a special signal if the rocket should be hit by a meteorite. That would settle, once and for all, the perennial question of the probability of getting your skull smashed by a meteor when you stick your head out of the earth's atmosphere.

Such an instrument probably would not be set off by the impact of individual particles of cosmic dust, but in time these might change the temperature of the rocket by reducing its light-reflecting power. If the effect should be very strong, which is unlikely, it could even reduce the orbiter's visual brightness.

To send findings back to the ground, the instruments would need a source of power of some sort. Batteries might not last long enough. It might be possible, however, to obtain the necessary power from the decay of radioactive substances in a manner that, if developed, would certainly be top secret.

Perhaps the sun's energy could be used for this purpose. It should be possible to devise thermoelements that, when heated by the sun at one end, would produce enough electric current for this purpose. Rather long antennas could be provided quite easily by having coiled-up steel wires in the head that would be released after the acceleration of the rocket stopped, sticking out as shown on the cover. These wires would also increase


200 MILES
PARTICLES RE-ENTERING ATMOSPHERE WOULD GLOW LIKE METEORITES
PATH OF METAL-DUST CHARGE
100 MILES
PATH OF ROCKET
EARTH

Attempt to put "artificial meteorites" into space was tried by Army more than a year ago by firing "shaped charges" from the head of a V-2 (PS, March '47, p. 66). Consisting of a sheet-metal "liner" blasted apart by high explosive, the charges produced a high-speed jet of fine metal dust. It was hoped that some of the metal particles, fired from the V-2 100 miles up, would carry an additional 100 miles or more, leave the atmosphere, and then be detected upon re-entering. Whether or not experiment was successful has not as yet been made public.

the size of the orbiter and make it a better radar target.

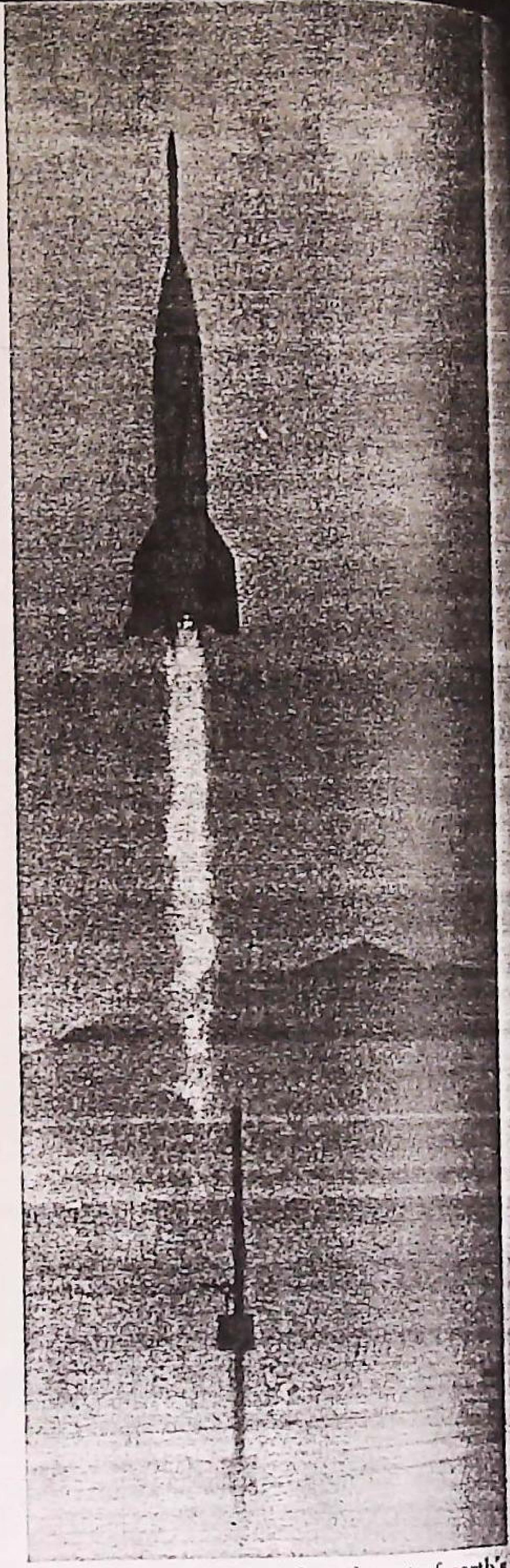
This brings us to the "passive" uses of such a vehicle—uses that would result simply from its existence. The problem of guiding very long-range missiles—say 3,000 miles or more—always raises the question of reference points. Astronomers are apt to point out that the star Regulus would be a fine reference point for various reasons. That would no doubt be true for space ships manned by navigators trained to recognize Regulus when they saw it. But a mere guiding mechanism might conceivably be fooled by a few dozen other stars. Even a robot, however, should not mistake an orbital rocket, from which a radar signal could be bounced back, for a distant star.

Navigating by Orbiter

Designers of guiding mechanisms for missiles are working on four methods. One is a two-beam system, with one beam on the target and one on the missile to provide it with orders that originate on the ground. The second is a one-beam system in which the beam is put on the target and the missile's mechanism is so designed that the missile returns to the beam whenever it accidentally leaves it. The third is the so-called "homing" mechanism. And the fourth is to teach the missile to do its own navigating. But when the navigation must be done over very long distances, it must be celestial navigation—and that is where an orbital rocket could be helpful.

It could perform similar service, of course, for a human navigator. If the orbiter could be made "visible" (not necessarily to the eye) to navigators of ships and aircraft, it would be a fine reference point for them. These human navigators have reference points now in the natural celestial bodies, but navigating by them at high speeds with portable instruments is not easy. An orbiter traversing almost two degrees of arc every half minute, along a predetermined course, would be a big help.

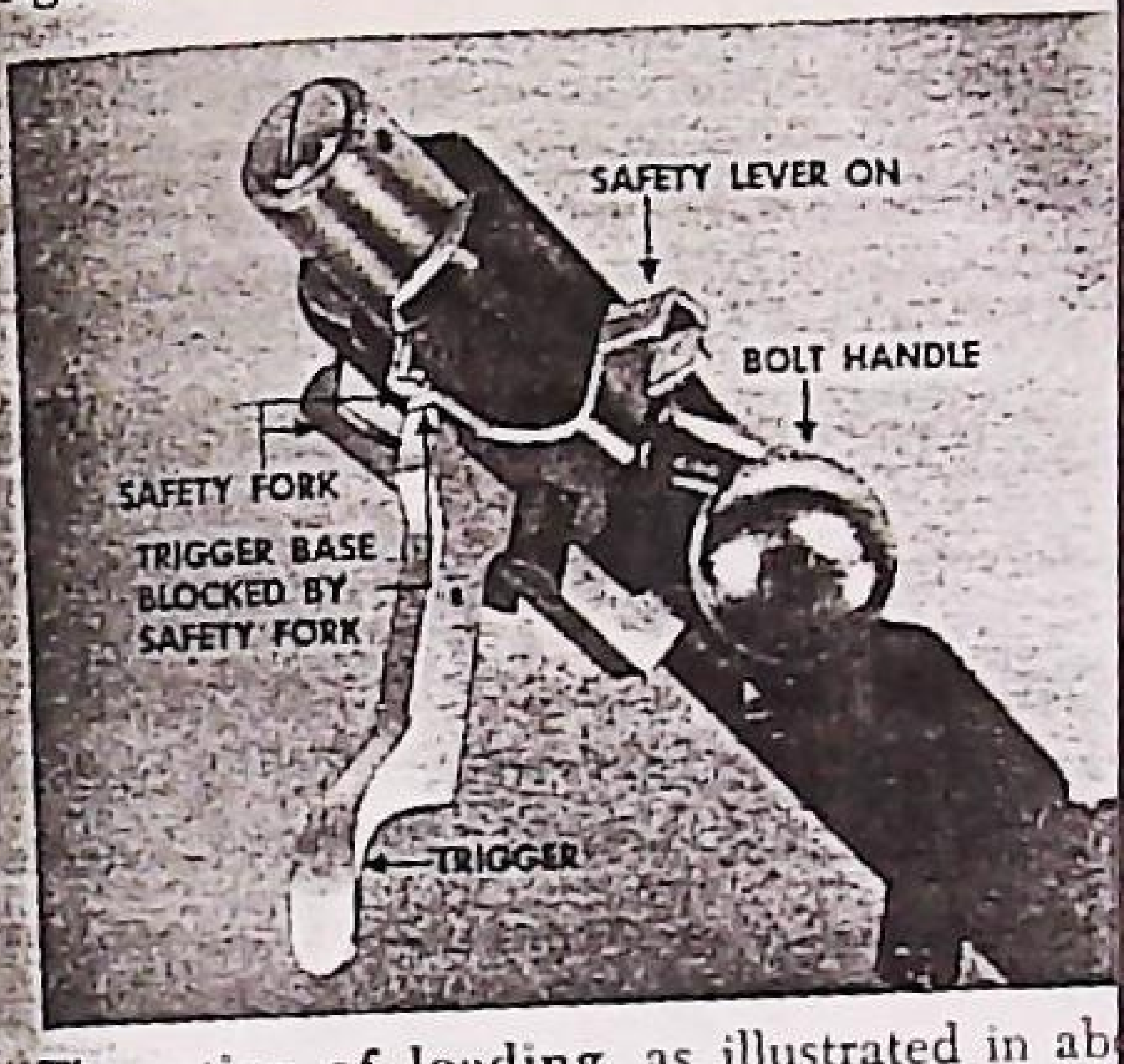
The idea is old. Computing the natural moon's orbit is such a tedious, difficult task that a French astronomer suggested a century ago that there ought to be a second smaller moon. None was ever found. But you may live to travel in a 10,000-m.p.h. plane, led to its destination by a man-made moon that simultaneously is radioing essential information to the engineers designing a ship for the first flight to Venus. END



Army's two-step rocket cleared most of earth's atmosphere when it reached record height of 250 miles. Consisting of small Wac Corporal fired from nose of larger V-2, it also hit record speed of 5,000 m.p.h. Orbiter would have to go 3½ times faster but less than twice as high.

Rifle Safety Can't Forget

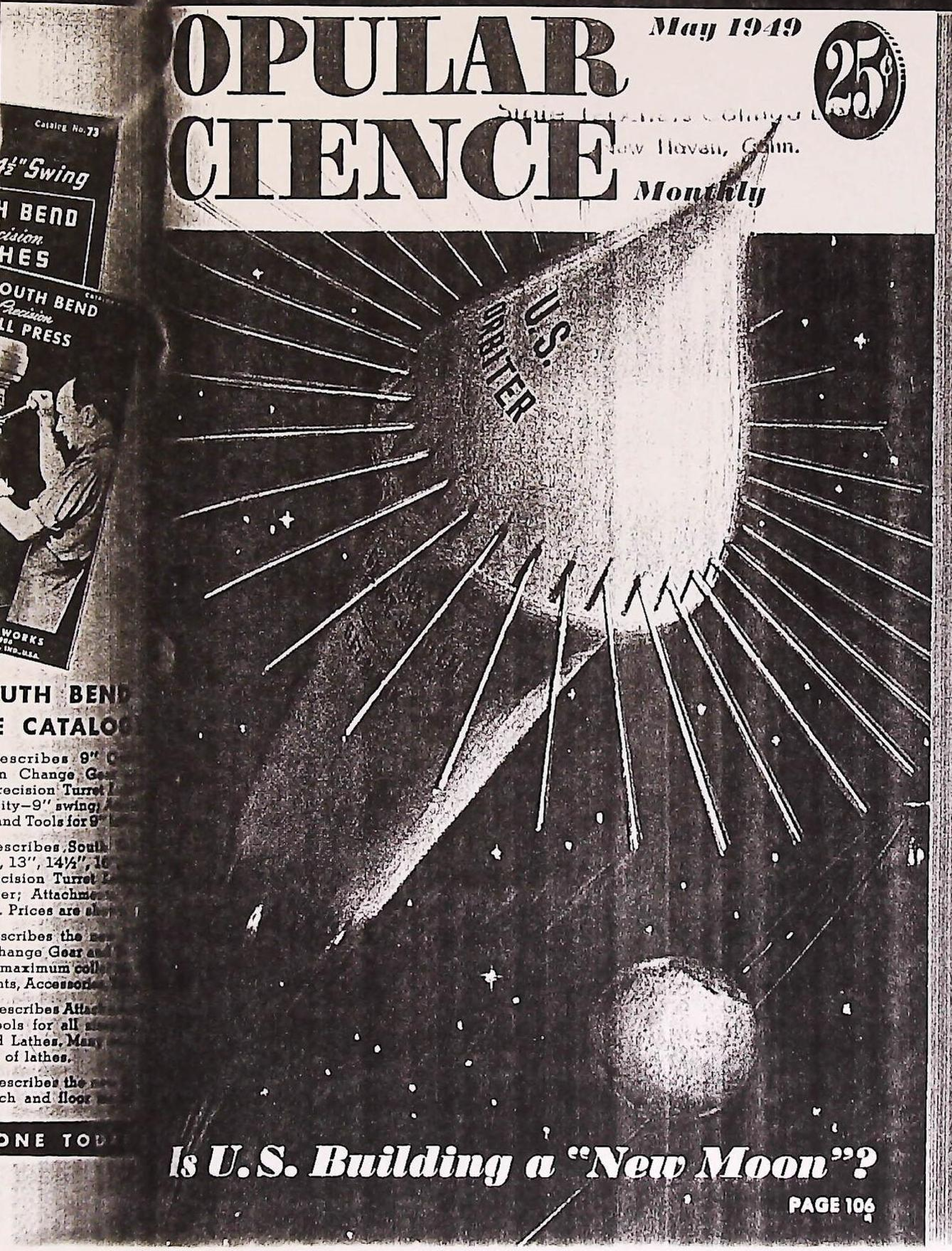
HERE's a rifle that you can't load without automatically locking a fool-proof safety device. It is a new .22-caliber, single-shot bolt-action Winchester (right) designed especially for young and inexperienced shooters. The very act of loading, pulling bac the bolt handle, makes it impossible to fir the rifle. And with the cartridge in plac you can't shoot it until you manually pus back the safety lever, uncovering a re warning dot. The Model 47, taking eithe .22 short or long cartridges, with a choice c sights, sells for around $20.



The action of loading, as illustrated in ab photo, pushes back forked safety lever. (tine of the fork gets in the way of trigger b and prevents it from hitting the firing pin.

Parajumpers Carry (

VOLUME 154, NUMBER 5
PAGES: 106-112
AUTHOR: WILLY LEY



OPULAR
CIENCE

May 1949

25¢

Monthly

State Teachers College L
New Haven, Conn.

Is U.S. Building a "New Moon"?

PAGE 106

Catalog No. 73
4½" Swing
H BEND
cision
HES
OUTH BEND
Precision
LL PRESS
WORKS
IND., U.S.A.

UTH BEND
E CATALO

escribes 9"
n Change Ge
recision Turret
ity—9" swing;
and Tools for 9"

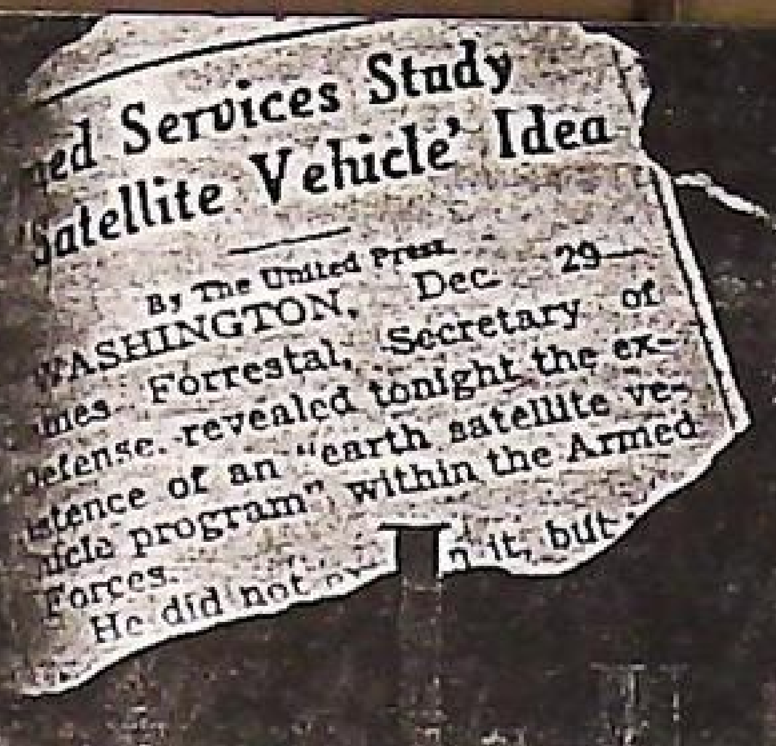
escribes South
, 13", 14½", 1
cision Turret
er; Attachme
. Prices are sh

scribes the
hange Gear a
maximum col
nts, Accesso

escribes Attac
ools for all
d Lathes. Ma
of lathes.

escribes the
ch and floor

ONE TO



ed Services Study
Satellite Vehicle' Idea

By The United Press.

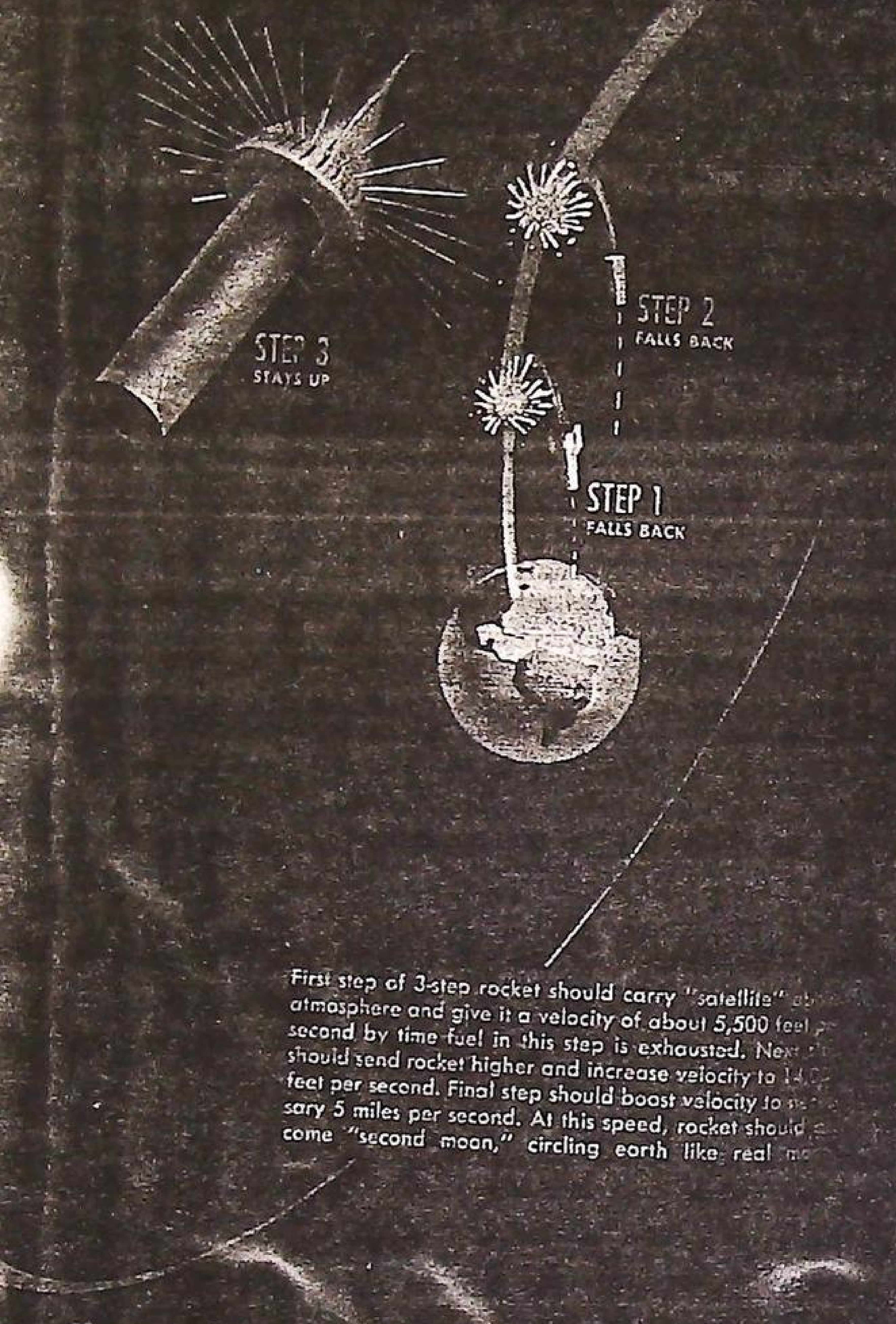
WASHINGTON, Dec. 29—
mes Forrestal, Secretary of
Defense, revealed tonight the ex-
istence of an "earth satellite ve-
hicle program" within the Armed
Forces.
He did not n it, but

Cover drawing by Ray Pioch

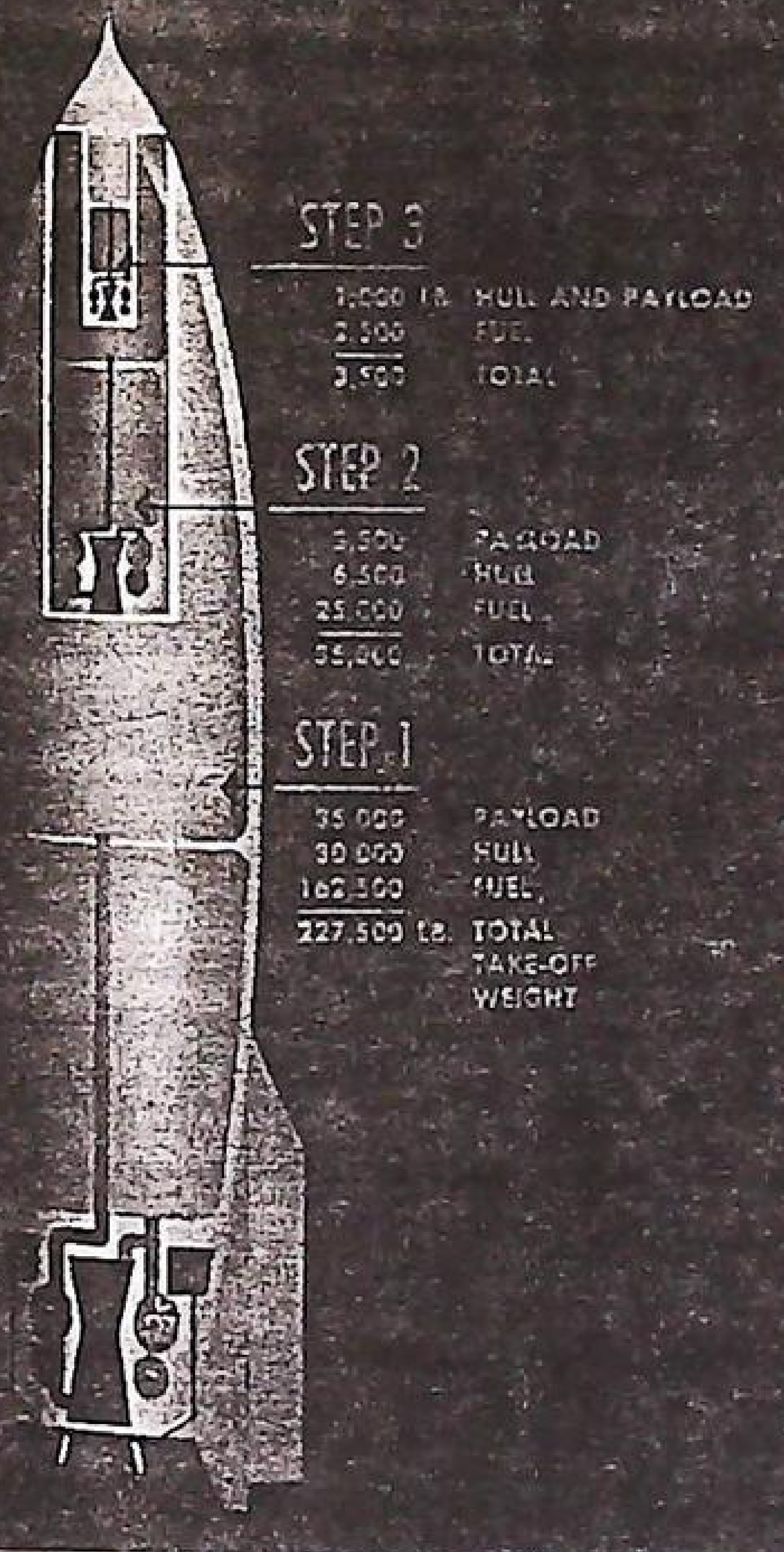
Is U.S. Building a New Moon?

One rocket has already pierced the earth's atmosphere; a faster one might leave it and circle forever.

By Willy Ley
Author of "Rockets and Space Travel"
Drawings by Jere Donovan


STEP 3
STAYS UP
STEP 2
FALLS BACK
STEP 1
FALLS BACK

First step of 3-step rocket should carry "satellite" ab atmosphere and give it a velocity of about 5,500 feet p second by time fuel in this step is exhausted. Next should send rocket higher and increase velocity to 14, feet per second. Final step should boost velocity to ne sary 5 miles per second. At this speed, rocket should come "second moon," circling earth like real mo


STEP 3
1,000 LB. HULL AND PAYLOAD
2,500 FUEL
3,500 TOTAL
STEP 2
3,500 PAYLOAD
6,500 HULL
25,000 FUEL
35,000 TOTAL
STEP 1
35,000 PAYLOAD
30,000 HULL
162,500 FUEL
227,500 LB. TOTAL TAKE-OFF WEIGHT

The Secretary of Defense has co-ordinated "earth satellite vehicle" research by the Army, Navy, and Air Force.

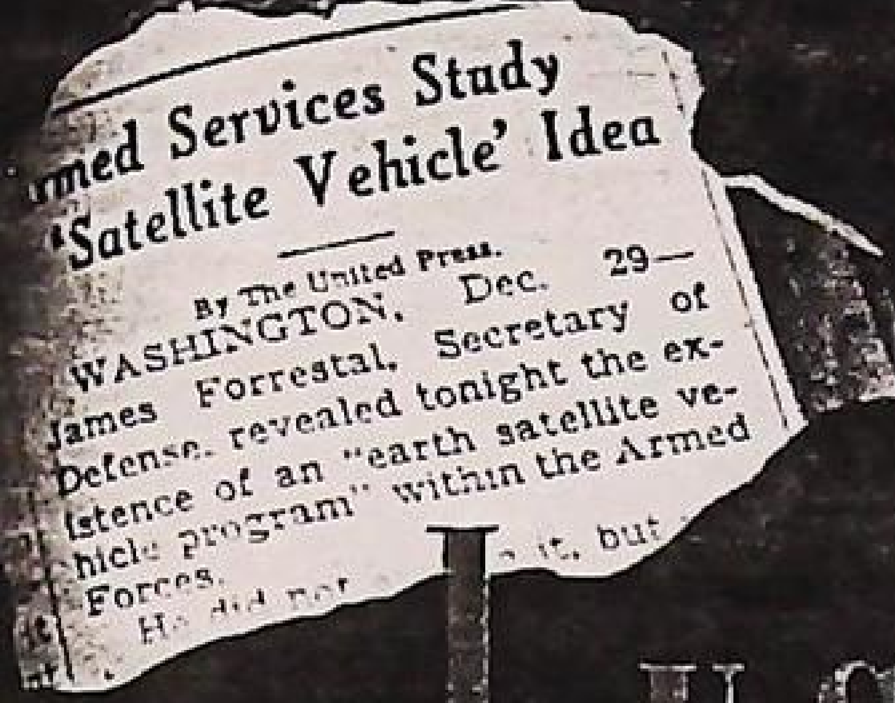
A 3,000-mile rocket-testing range has been requested.

Curtiss-Wright foresees a 10,000-m.p.h. "space ship."

Lockheed's chief engineer says: "Escape from the earth is far closer than most people think."

SUCH revelations made POPULAR SCIENCE editors ask: Is the United States now building a new moon?

No hints as clear as some of these preceded the first A-bomb's shock wave. Space ships, defense officials now say, are "a matter of highest secrecy." So the men who know exactly what's coming up and when are mum or enigmatic. Some of the rumors you may have heard, and some of the headlines, have been preposterous. But, beyond a shadow of possible doubt, American scientists and engineers are working on an "orbit-

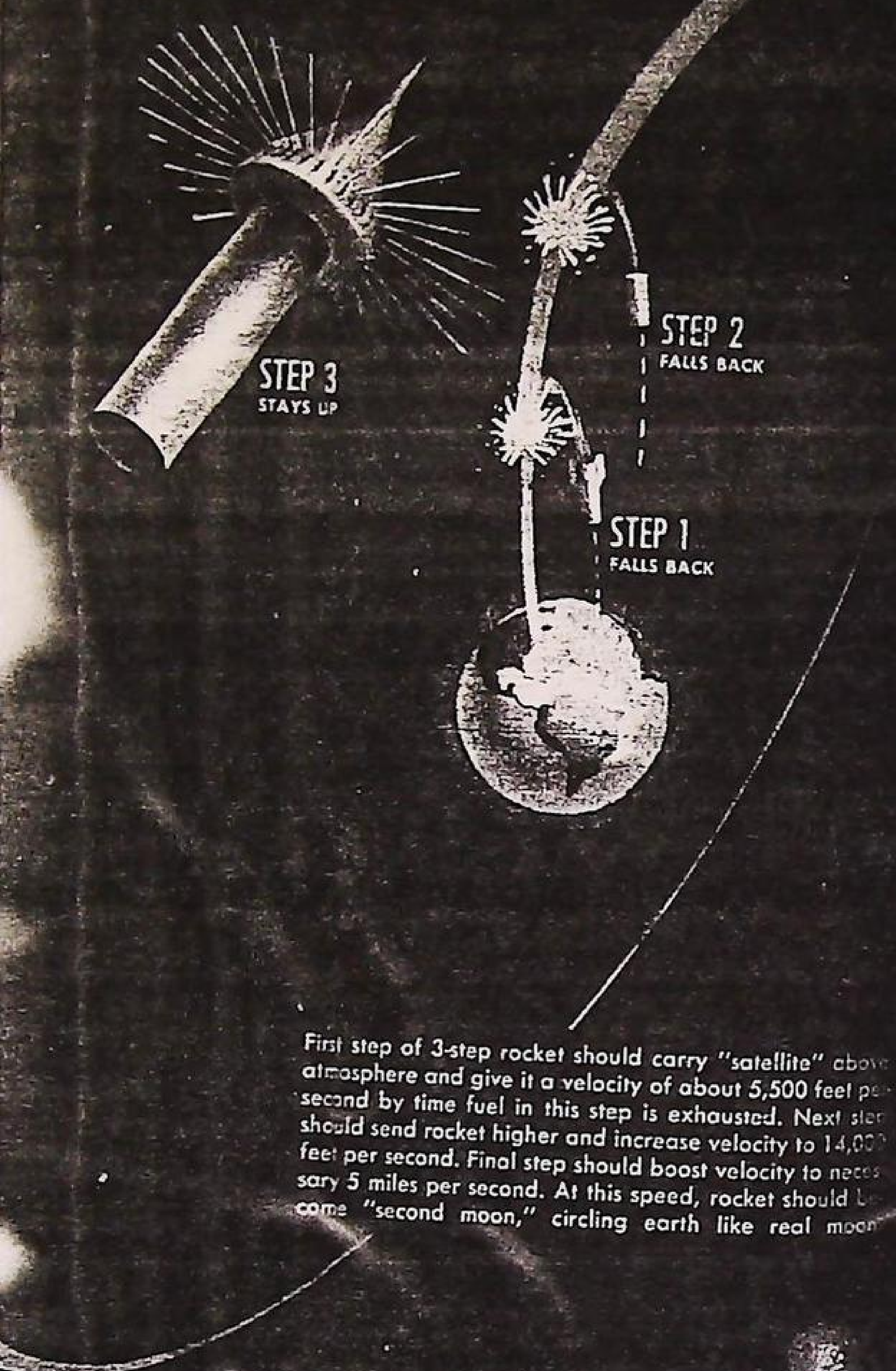


rmed Services Study
'Satellite Vehicle' Idea

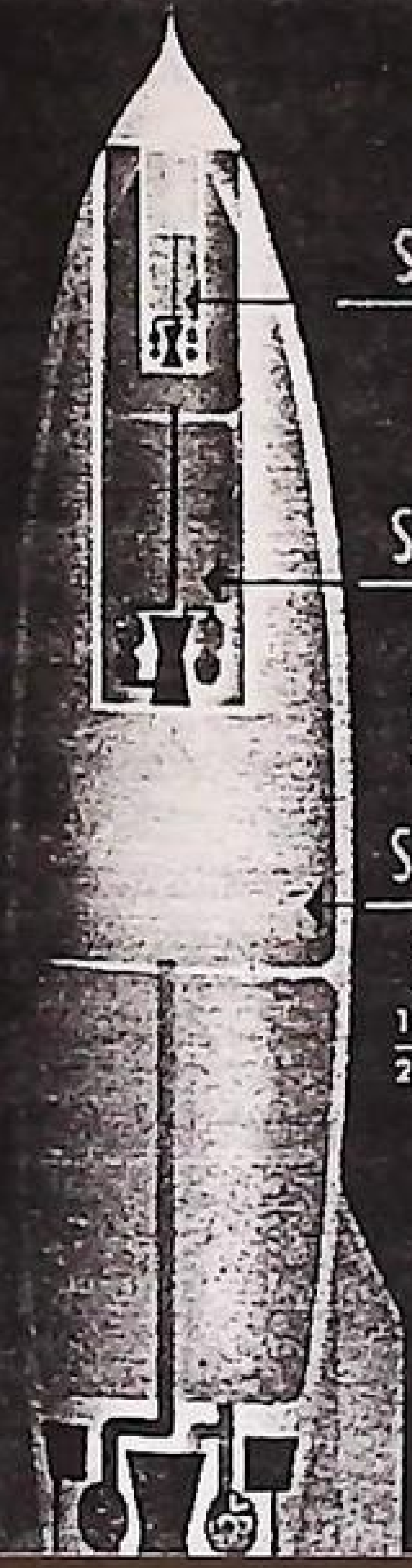
By The United Press.

WASHINGTON, Dec. 29—James Forrestal, Secretary of Defense, revealed tonight the existence of an "earth satellite vehicle program" within the Armed Forces.

He did not [illegible] it, but



First step of 3-step rocket should carry "satellite" above atmosphere and give it a velocity of about 5,500 feet per second by time fuel in this step is exhausted. Next step should send rocket higher and increase velocity to 14,000 feet per second. Final step should boost velocity to necessary 5 miles per second. At this speed, rocket should become "second moon," circling earth like real moon.



STEP 3

1,000 LB.	HULL AND PAYLOAD
2,500	FUEL
3,500	TOTAL

STEP 2

3,500	PAYLOAD
6,500	HULL
25,000	FUEL
35,000	TOTAL

STEP 1

35,000	PAYLOAD
30,000	HULL
162,500	FUEL
227,500 LB.	TOTAL TAKE-OFF WEIGHT

POPULAR SCIENCE

Cover drawing by Ray Pioch

Is U.S. Building a New Moon?

One rocket has already pierced the earth's atmosphere; a faster one might leave it and circle forever.

By Willy Ley
Author of "Rockets and Space Travel"
Drawings by Jere Donovan

THE *Secretary of Defense has co-ordinated "earth satellite vehicle" research by the Army, Navy, and Air Force.*

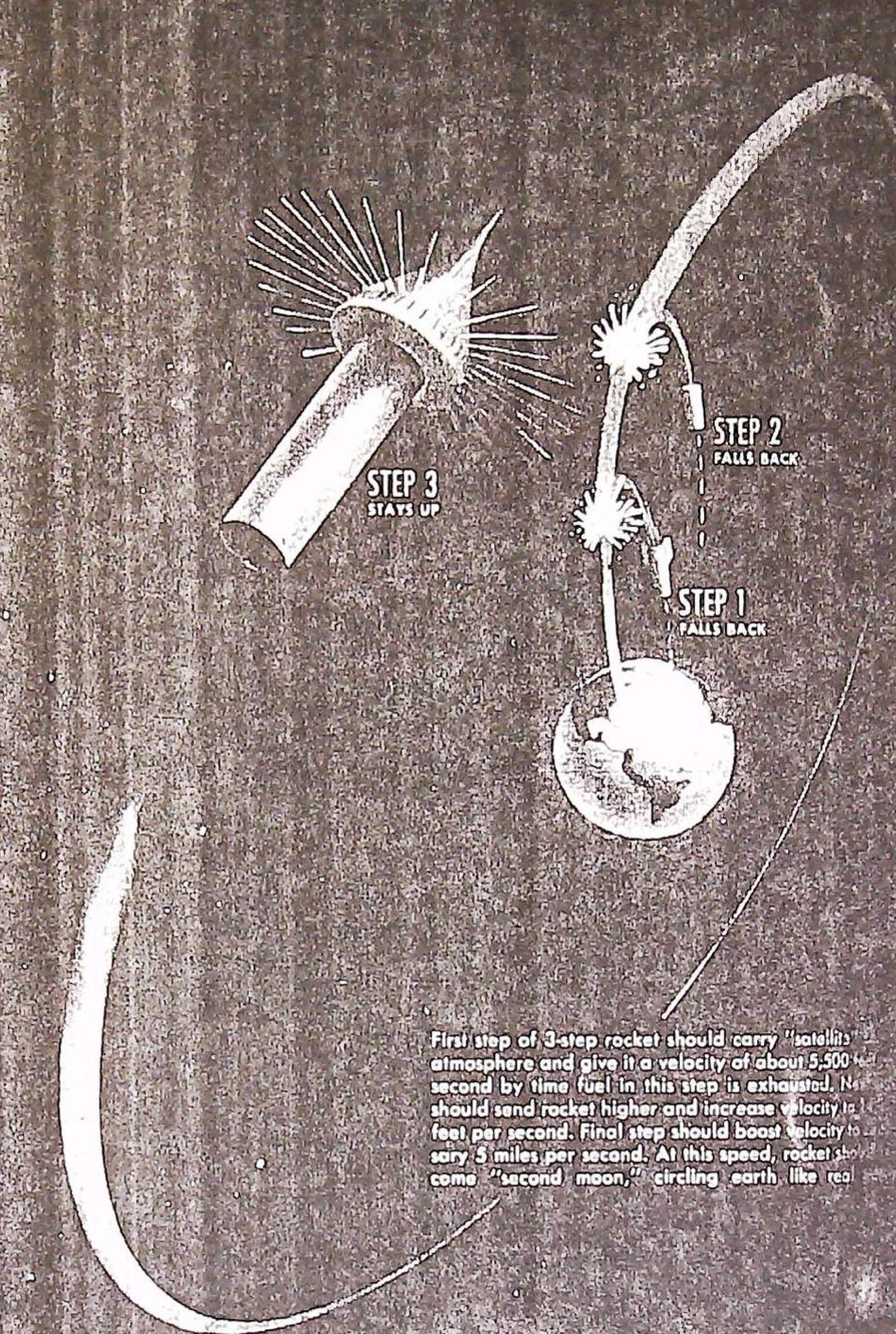
A 3,000-mile rocket-testing range has been requested.

Curtiss-Wright foresees a 10,000-m.p.h. "space ship."

Lockheed's chief engineer says: "Escape from the earth is far closer than most people think."

SUCH revelations made POPULAR SCIENCE editors ask: Is the United States now building a new moon?

No hints as clear as some of these preceded the first A-bomb's shock wave. Space ships, defense officials now say, are "a matter of highest secrecy." So the men who know exactly what's coming up and when are mum or enigmatic. Some of the rumors you may have heard, and some of the headlines, have been preposterous. But, beyond


STEP 3
STAYS UP
STEP 2
FALLS BACK
STEP 1
FALLS BACK

First step of 3-step rocket should carry "satellit
atmosphere and give it a velocity of about 5,500
second by time fuel in this step is exhausted. N
should send rocket higher and increase velocity to
feet per second. Final step should boost velocity to
sary 5 miles per second. At this speed, rocket sh
come "second moon," circling earth like rea

Armed
'Sat

July 1949
Popular Science

Vol 155 #1

Building A New moon [PS May '49, p 106]. He states that a 10,000 mph craft could never

Take 1½" to 40" I. D.'s easily and accurately with

LUFKIN INSIDE MICROMETERS

CHECK THESE FEATURES
which combine to make your work of taking inside measurements rapid, accurate and free of errors.

Tubular, light-weight measuring rods can be added to both ends of the micrometer head, thus keeping the head central and in balance, assuring precise readings—more sensitive "feel."

Ground threads on micrometer heads assure smooth operation and great accuracy. Rods and caps ground to extremely close limits to permit interchangeability. Heads have "Rapid Reading" (each thousandth numbered) to eliminate errors in reading. Lock nut holds measurement firmly.

Flat surface on knurled collar opposite reading line makes it easy to instantly find reading line even in poor light.

Write Dept. S for fascinating booklet, "The Amazing Story of Measurement." Enclose 10c (no stamps) to cover handling and mailing.

The AMAZING story of MEASUREMENT

Buy LUFKIN

Precision Tools • Tapes • Rules • FROM YOUR DEALER
The Lufkin Rule Company • Saginaw, Michigan

Blackett on the Bomb

Sir:

I fully understand that there are many points in my exposition [of the atomic bomb's role in a war between major powers] that are open to doubt and criticism. You are certainly correct in supposing that certain key target systems such as oil might be a vulnerable point in a country's defense. Clearly if this is so, then the defending country is likely to be extremely secret about the location of its reserves, storage, plants, etc. It is not possible to be quite sure what would happen in a future war with atomic bombing against Russia, and it is possible that the Russian oil industry could be effectively destroyed. However, I do not feel that this is by any means certain.

P. M. BLACKETT

The Physical Laboratories
The University, Manchester, England

Nobel-prize-winner Blackett is the author of "Fear, War, and the Bomb." His views were summarized and criticized in PS (May '49, p. 124).

Old Idea, New Difference

Sir:

It is interesting to note that the fixed "convertible" type idea is not new, but was used by Studebaker almost twenty-five years ago, PS, May, page 134. The Studebaker Duplex Phaeton came in three sizes: Standard Six, Special Six, and the Big Six. The price of the Special Six sedan as of November 1924 was $2,150. The price of the Special Six Duplex Phaeton was $1,495, nearly $700 less. Today, the fixed convertible models sell for as much as $1,000 *more* than the sedan models.

JAMES M. STRONG, JR.

West Hartford, Conn.

How to Make a Moon

Sir:

Willy Ley usually has no trouble backing up his statements, and I am curious to see if he can prove one he makes in "Is U. S.

INVENTOR

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBS

Registered Patent Attorneys
92-G DISTRICT NATIONAL BUILDING • WASHINGTON 5, D. C.

Patents
Trademarks
Copyrights

CLARENCE A. O'BRIEN & HARVEY JACOBS
Registered Patent Attorneys
92-G District National Bldg., Washington 5, D. C.
Please send me copy of "Patent Guide for the Inventor" and
"Record of Invention" form. This request does not obligate me.

Name__________
Address__________
City__________ State__________
(Please write or print plainly.)

Want BIG PROFITS
IN YOUR OWN BUSINESS?
NEW "MIRACLE FINISH"
MAKES IT EASY

FLOK KRAFT

SPARE TIME — FULL TIME

HELP FILL HUGE DEMAND—Yes rich profits are waiting to be tapped in this NEW field. New MIRACLE FINISH gives a velvety, luxurious surface to radios, lamps, toys, signs, store displays, figurines, auto dash boards and hundreds of other items. Make old objects beautiful and saleable—make new things *worth much more* with this soft, rich covering that can be applied to *any* surface.

START RIGHT AWAY—You can learn in a few days to start MAKING MONEY! Everything you need is furnished including fully illustrated instructions that are *complete* and EASY to understand. Every point is explained, to show you how to start on the road to BIG MONEY, spare or full time *right in your own home*.

RADIOS
JEWELRY BOXES
LAMPS
TOYS
CAR TRUNKS
CAR DASHBOARDS
DISPLAY PIECES

BE A MODERN ALADDIN
Flok-Kraft makes old things new! Covers:- Wood, Plastic, Fabric, Metal, Glass, Plaster —any surface.

EVERYTHING COMPLETE—In addition to full instructions, you get a complete set of materials that enable you to start at once. A few cents worth of materials can mean many dollars in return to you. $5.00 per hour and more is easy—Add to your income from regular job or start your own business.

ACT NOW—grasp this opportunity TODAY—Start your own business. It's too good to miss! SEND NO MONEY—Mail coupon today for full details and *free* sample of FLOK-KRAFT covered material and hundreds of useful and profitable ideas.
Do it NOW— be first!
SEND NO MONEY

MAIL COUPON NOW!

COAST INDUSTRIES Dept. 17
1004 S. Los Angeles St., Los Angeles 5, Calif.
Gentlemen: Please rush me all the details.
NAME ____
STREET ____
CITY ____
STATE ____

could never slip out of the grip of earth's gravity. If he means that this holds true with those fuels we now have at our disposal, he is probably right.

But we should some day, in the not-too-distant future, perfect an atomic drive for space craft. With an ample fuel source, such as an atomic drive would have, what is to prevent a space craft from accelerating to 10,000 m.p.h. and holding that speed with the power on until it reaches the neutral point of gravitational influence between the earth and the moon, or even Mars or Venus?

Neil J. Crandall

Denver, Colo.

Sir:

. . . Why a three-stage rocket? The exhaust velocity of five miles per second can easily be reached with hydrogen and oxygen fuel. . . .

Donald Radford Wright

Felton, Calif.

Let Willy Ley speak for himself:

Since the whole article was devoted to the proposition of an orbiter with chemical fuels, atomic energy was clearly not under consideration.

The reason for making the rocket a three-step rocket, and for calculating the weights which I used in my article, is that I wanted to show that the orbiter could be established by the use of well known and well tried fuel combinations, namely watered alcohol and liquid oxygen. I know, too, that hydrogen will produce higher exhaust velocities—in fact almost three times as high as those used in my calculations. But it is not yet a well tried fuel; we don't know how long the motor would stand up.

Besides, hydrogen is not quite as wonderful as its high exhaust velocity may seem to indicate. Because it is of very low density, even when liquid, the rocket would need very large tanks, which would reduce the ratio between take-off weight and dead weight.

PS Bird House Wins Prize

Sir:

I've always wanted to write and tell you how I enjoy your magazine and how useful it always is. I've been reading your maga-

TELEVISION WILL BE THERE..WILL
TELEVISIO
RADIO • ELECTRO
OSCILLO-SCOPE
MULTI-METER
6-TUBE RECEIVER
YOU BUILD AN
THIS EQUIPM
WORK OVER
HOME EXPERI

OUR GREATEST OFFER IN 17
• BULLETIN!

Fires, Sporting Events, Major happenings and other news events are being covered by Television Camera Crews in a growing number of areas. Let us show you how to prepare to enter the profitable and exciting technical phases of Television, Radio, Electronics. Mail coupon. Get Free information about our greatest offer in 17 years.

Send for FREE Information

See HOW—in your own home—DeForest's Training, Inc., now brings you one of today's most complete combinations of major home training aids. You (1) Learn-by-Seeing from D.T.I.'s exclusive instructive Home Movies. You (2) Learn-by-Reading from well-illustrated lessons. And (3), you set up your own HOME LABORATORY where you Learn-by-Doing from 16 shipments of Radio-Electronic parts which you use and KEEP to work over 300 instructive... fascinating projects. This includes building the valuable 6 tube "Superhet" RADIO and commercial-type OSCILLO-SCOPE, R-F SIGNAL GENERATOR, and Jewel-Bearing MULTIMETER, pictured at right. You may use this test equipment to help you earn real money—both in your spare time and later when working full time in the field either in a good job or your own business. Get complete facts. Mail coupon today!

EMPLOYMENT SERVICE
When you complete your training, our effective Employment Service is available to you without extra cost—a valuable aid to help you get started.

MODERN CHICAGO LABORATORIES
If you prefer, you can get ALL your preparation in our new Chicago training laboratories—among the finest of their kind. Train quickly, using a wide variety of commercial equipment . . ample instructors . . every major training advantage. Write for details. (The Chicago Laboratory Program is available to qualified veterans under the G.I. Law.)

You also use HOME MOVIES!
..a D.T.I. Exclusive!...
D.T.I., alone, includes the use of one of today's most effective training aids...MOVIES...to help you learn important fundamentals faster, easier at home. See electrons on the march, and other fascinating "hidden action"—a remarkable home training advantage that speeds your progress.

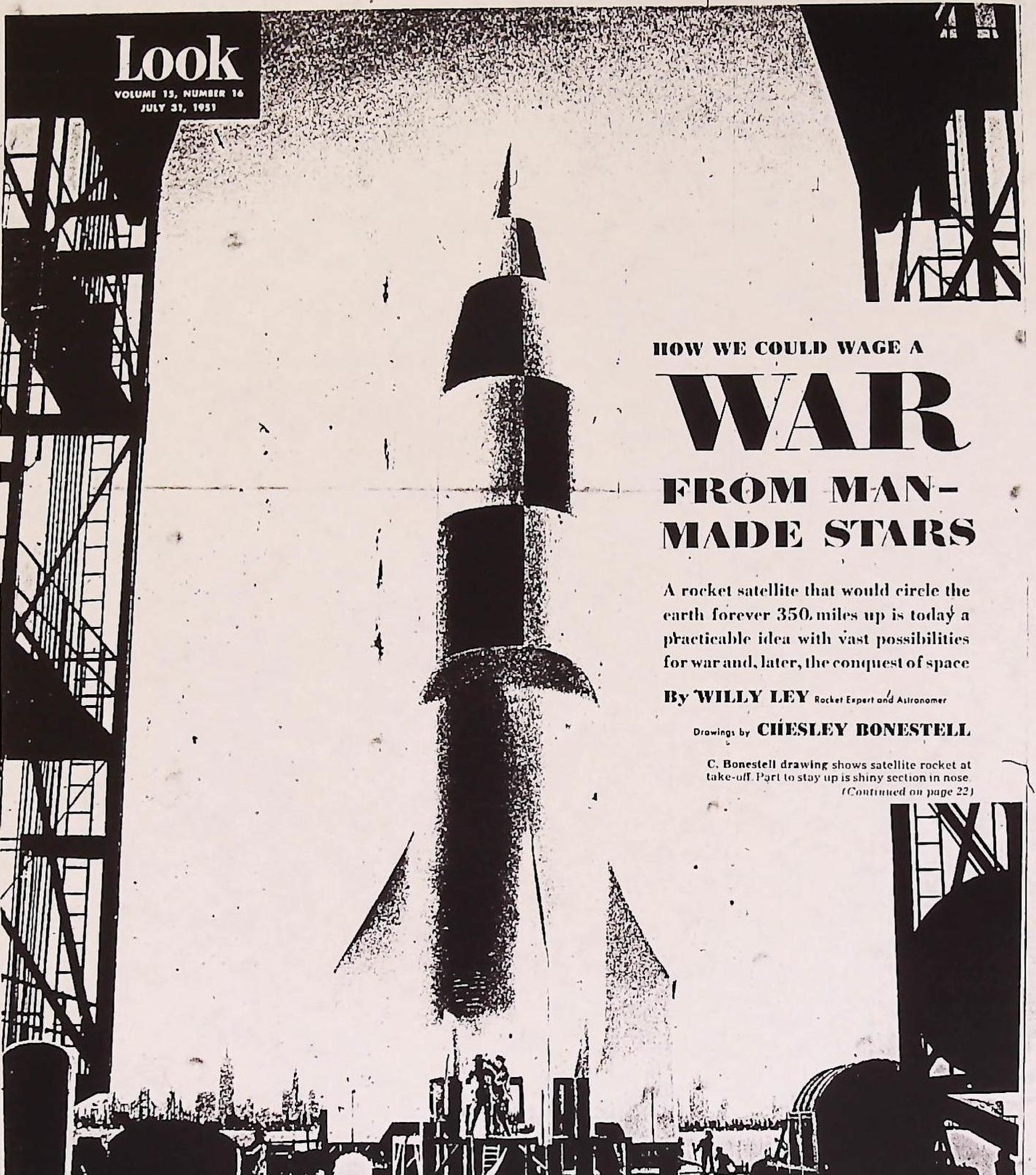
DeFOREST'S TRAINING, INC.
CHICAGO 14, ILLINOIS
Affiliated with the DeVry Corporation, Builders of Electronic and Movie Equipment

MAIL THIS OPPORTUNITY COUPON

DeForest's Training, Inc.
2533 N. Ashland Ave., Dept. PS-F7
Chicago 14, Illinois
Please give me complete facts showing how I may prepare to make my start in Television-Radio-Electron
Name ____ Age ____
Street ____ Apt. ____
City ____ Zone ____ State ____

LOOK July 31, 1951 Vol # p 20

Look
VOLUME 15, NUMBER 16
JULY 31, 1951



HOW WE COULD WAGE A

WAR FROM MAN-MADE STARS

A rocket satellite that would circle the earth forever 350 miles up is today a practicable idea with vast possibilities for war and, later, the conquest of space

By WILLY LEY Rocket Expert and Astronomer

Drawings by **CHESLEY BONESTELL**

C. Bonestell drawing shows satellite rocket at take-off. Part to stay up is shiny section in nose.

(Continued on page 22)

MAN-MADE STARS continued

WHOLE EARTH

could be seen through TV installed in rockets, showing foe's moves

A ROCKET that will stay up in the sky like a star and serve as a platform for the conduct of a war is today a practicable idea.

It's even possible that a project is already under way to build one.

Whether such a project has been begun no one can say. The United States Government, which would be the only possible sponsor of an endeavor of this kind, isn't talking.

But the Government is known to be interested in the idea. It has financed two studies on conditions beyond the earth's atmosphere. And in the last report written by the late Secretary of Defense, James Forrestal, reference was made to "studies of the satellite vehicle project."

Exactly what that phrase referred to isn't known. It is a sober fact, however, that a rocket that circles the earth like a satellite is literally the next goal of rocket engineering. It is something that could be accomplished with well-known rocket fuels, and no new discovery or major invention would have to be made first. It is something on which one could go to work now.

To a rocket engineer, the idea is as feasible as a 100,000-ton ocean liner is to a naval engineer. No liner of such size has been built yet, and building it would take some time. But nobody doubts that it could be done.

Likewise, no rocket of the necessary size and weight to reach the height of a circling satellite has been built yet, and it could not be built in a week or a month. But those who are able to judge have no doubt that it could be done, and for probably not more than 50 million dollars.

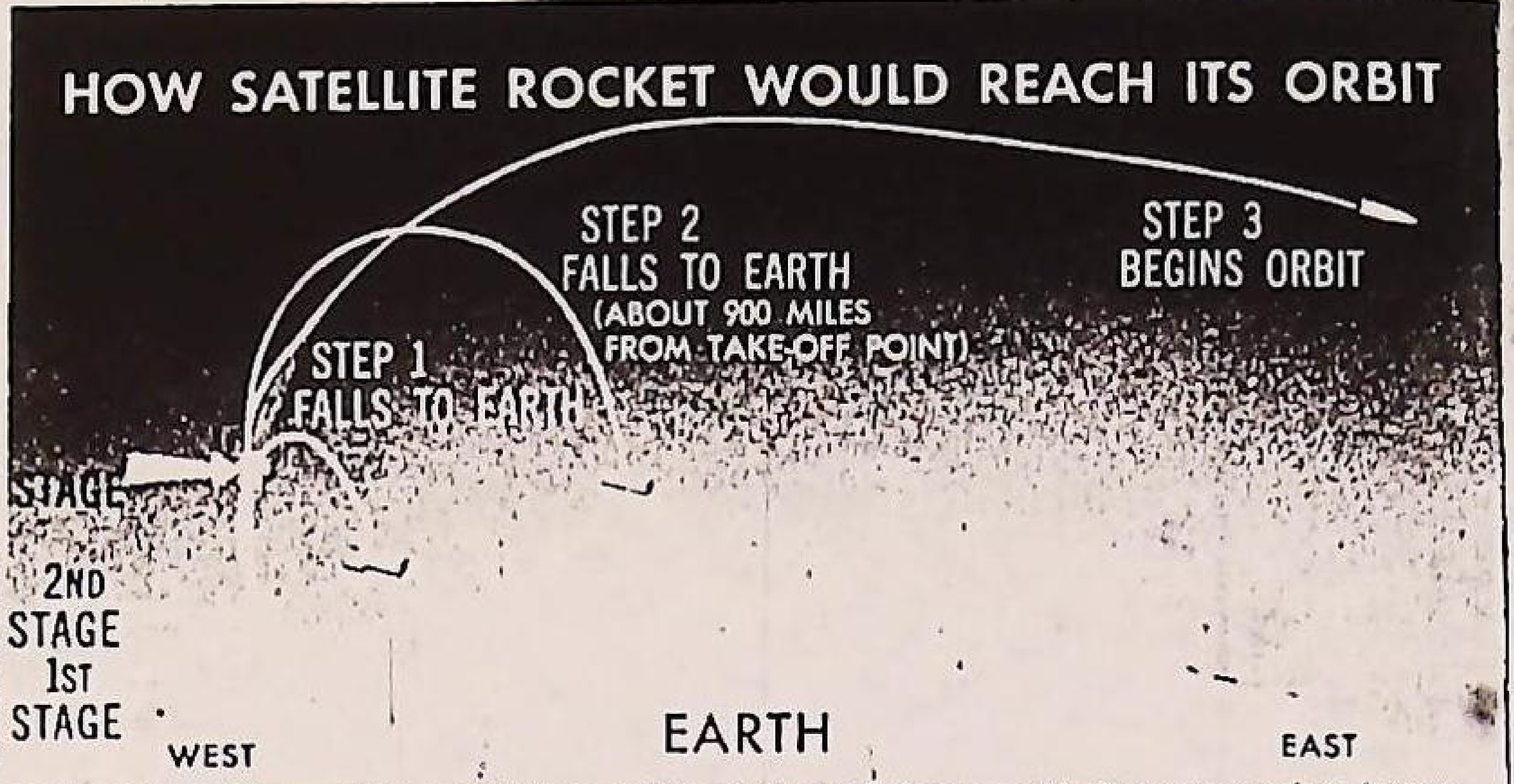
Would Give Us Space Data

If one were built, it could play a decisive role in a war. Circling the earth like an express moon, a "satellite rocket"—or "orbital rocket," as it is also known—could be used in a variety of ways to bring military victory.

In guided-missile warfare, for instance, the man-made satellite would be to the new weapons now being developed in that field what radio control is to a pilotless plane.

One of the main difficulties with long-range missiles is that they have to do their own navigating. The guiding technician, on the ground, can assist the missile for only a comparatively short distance—for radio and radar waves are not effective beyond the horizon for this purpose. After that, the navigating mechanism must be provided with another reference point for almost instantaneous corrections. The long-range missile does not need to get very far off course to miss a target by 50 miles or more.

Willy Ley, author of this article, pioneered in rocket work in his native Germany before coming in '35 to the United States, of which he's now a citizen. He is the author of *Rockets, Missiles and Space Travel*, recently published by the Viking Press.



Drawing by Al Evers

Man-made satellite could be sent high enough to circle earth forever with three-step rocket: lowest section lifts whole 30 miles, then drops; next, second step takes over; third step covers last lap.

It would be possible, of course, to have a relay of ships across the ocean which would take over the guiding; a technician on each ship would "hand" the missile to a colleague on the next ship after it passed by, and so on. But the enemy would be well aware of what was going on and could do something about it.

It might also be possible, perhaps, for the missile to bounce a radar echo off the moon and thus follow and correct its course itself. But the moon is 239,000 miles away, and doing that would require a rather powerful radar set. It wouldn't be too difficult for a radar set on the ground. But it would be an almost impossible task for one light enough to be put into a missile. And the radar impulse would need 2½ seconds to go to the moon and come back. That delay, even if it didn't ruin the steering at a critical moment, would have to be accounted for and a means of correction would have to be built into the mechanism.

If there were a satellite rocket in space, however, the problem of holding the missile on course would be much simpler. The time delay in getting a radar echo from a satellite just beyond the earth's atmosphere would be about 1/200th of a second, thus the radar set could be much smaller.

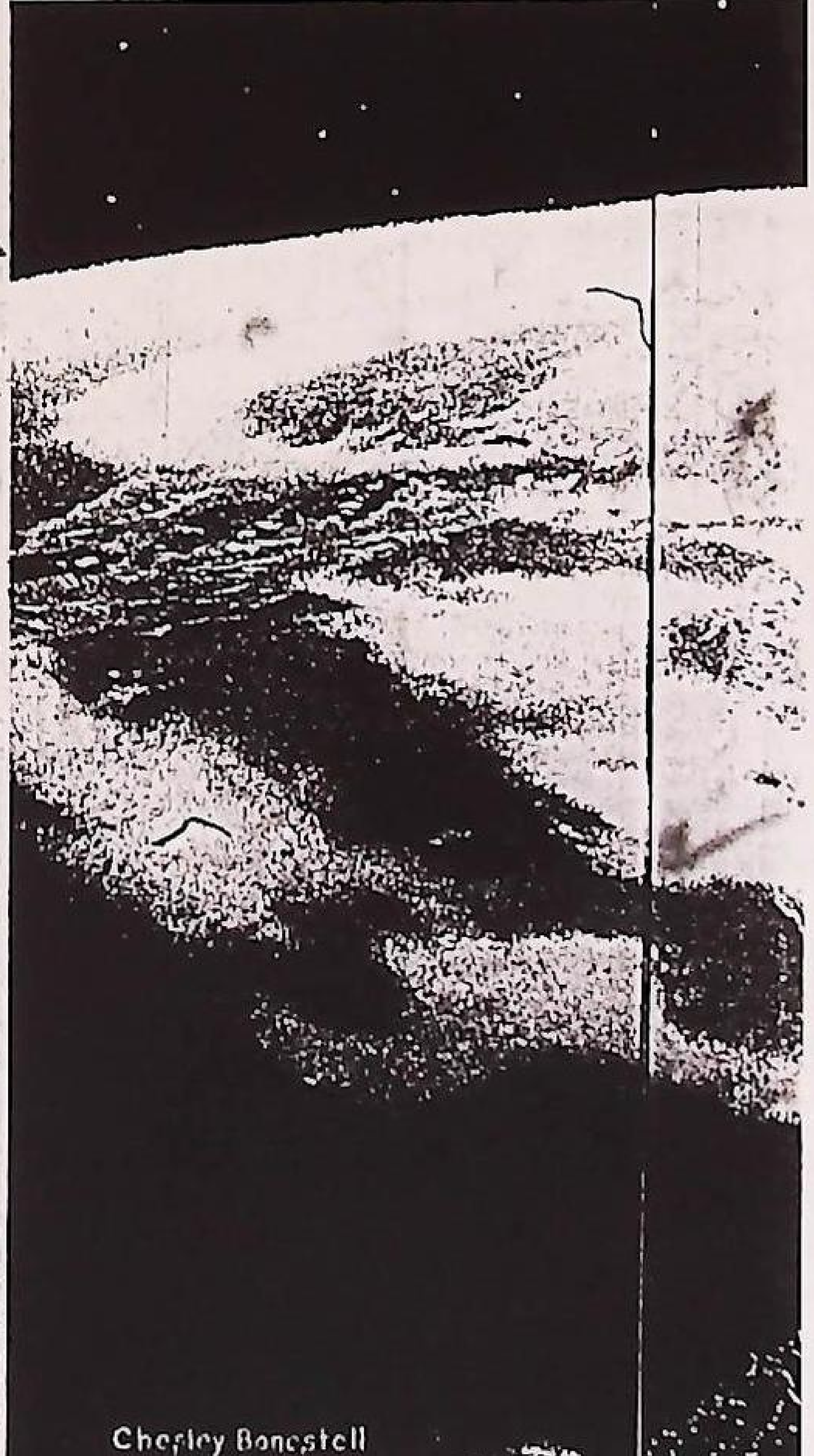
This is just one possibility of the man-made satellite. And it would derive from the mere presence of the orbital rocket in the sky. If that rocket were more than just an empty shell and were fitted with instruments, the possibilities would be many more.

The high-altitude research rockets of today already carry a complex set of scientific equipment. Into a satellite rocket, one could equally well put a television camera. With such a device, an observer on the ground would be able to see the earth as viewed from hundreds of miles up. The picture would not be just a single view, as in one of those photographs that have been taken from rockets in the upper stratosphere. It would be a continuous picture showing everything in the rocket's line of vision as it moved around the earth.

With one or several such TV-equipped watchdogs in the sky, it would be impossible for an enemy to mass troops and fleets without being observed. Of course, the rocket would not be able to see through an overcast, but there are not too many areas on earth where overcasts last for weeks without a break. The effect would be to give us ample warning in the event a foe prepares any large-scale aggression, and perhaps to guarantee us against another Pearl Harbor.

In another important aspect of military preparedness—meteorology—an orbital rocket

View of earth like this "shot" of Korea would be possible with a rocket satellite equipped with



Chesley Bonestell

equipped with TV would be invaluable. A meteorologist, watching a TV transmission from a rocket, would get a far better insight into the weather brewing over large areas than he could from the customary weather map, which needs many weather stations and many hours of work to assemble. He might miss some fine details somewhere, but his over-all picture would be much better.

Rocket Would Aid Navigation

These are just some of the vast military possibilities of an orbital rocket today.

For peacetime purposes, the satellite rocket offers still other possibilities. Equipped with scientific instruments, it could give us valuable material on conditions in interplanetary space near the earth. It would be invaluable in navigation, for its position at any given time would be known exactly; this would make it possible for ships and civil planes to get precise "fixes." And, equipped with a TV camera, a man-made satellite might even be a substitute for the iceberg patrol.

With further research and experimentation, an orbital rocket holds the promise of almost unlimited uses in both peace and war.

But right now, almost nothing except the job of putting one together stands in the way of having a man-made satellite. Rocket experts are no longer theorizing about one. They are already considering design detail—thinking in terms of weight quotas and desired speeds.

To put an artificial satellite into space, the experts know, would require a rocket weighing some 110 tons at take-off and standing about 70 feet high. The most massive rocket so far, the ex-German A-4, better known as the V-2, stands over 46 feet high and weighs around 12½ tons.

This may seem to leave us with a long way to go. But near the end of the war, the Germans already were drawing plans for a rocket standing around 60 feet high and weighing some 85 tons. The required size for an orbital rocket begins to look more or less like a real possibility when you know this.

That figure of 110 tons does not mean that the rocket that gets into space would weigh that much. It would weigh only about 1000 pounds, or half a ton. The difference of 109½ tons is what would be needed to lift that half ton against the earth's gravity through the atmosphere and provide it with the necessary speed to stay in space.

Once in its orbit, the half-ton rocket would neither "fall down" nor need any fuel to remain where it is. It would behave just like our natural satellite, the moon. This shows no inclination to fall on our heads and does not need fuel to keep itself going. The reason is that the speed at which the moon moves in its orbit creates just enough centrifugal force to counterbalance the earth's gravity at that distance.

For the moon, at a distance of 239,000 miles, a velocity of ⅔ of a mile per second is enough to establish equilibrium. Moving so slowly, as cosmic velocities go, the moon needs about a month to go around the earth once. If it were farther away, it could be still slower in its orbit. But if it were closer, it would have to speed up to remain a satellite.

At a distance of 22,300 miles, for example, the moon would have to move at about 2 miles per second and would get once around the world in 24 hours. At a distance of slightly over 1000 miles, it would have to travel at 4.4 miles per second and race around the earth in two hours. And if it were low enough just to clear the highest mountains in its path (an impossibility in reality, of course, because of air resistance), it would have to move at a speed of 5 miles per second and swing around the earth once in a little over one hour, 20 minutes.

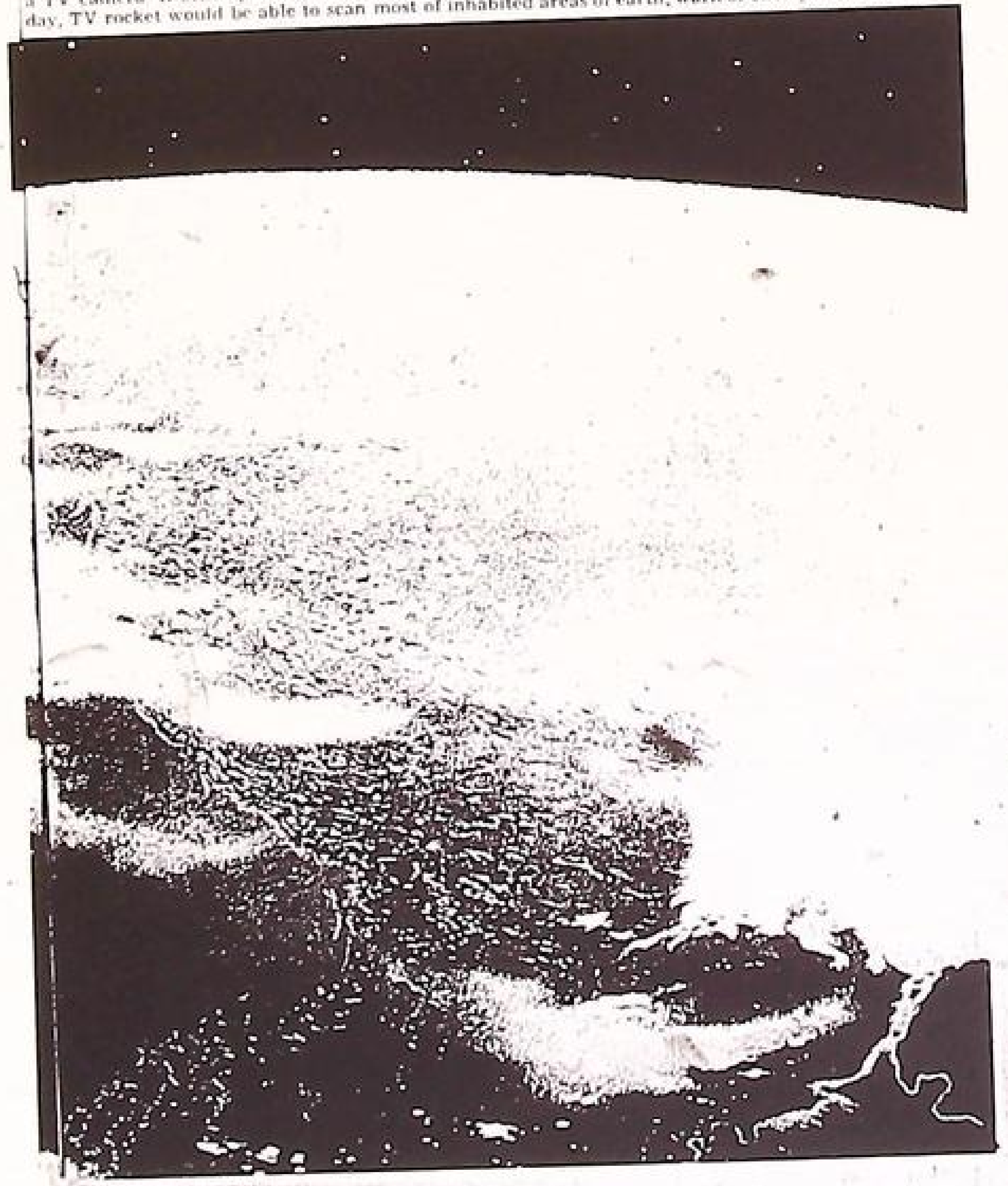
These facts about our natural satellite, which astronomers have no trouble in calculating, also hold true for a man-made satellite. Our first problem, then, has been to find out just how high a useful artificial satellite should be.

Naturally, it must be above the atmosphere of the earth or else air resistance would cause it to crash after a few revolutions. The highest a rocket has reached so far is 250 miles, a feat that was accomplished for the first time on February 24, 1949, from the White Sands Proving Ground in New Mexico.

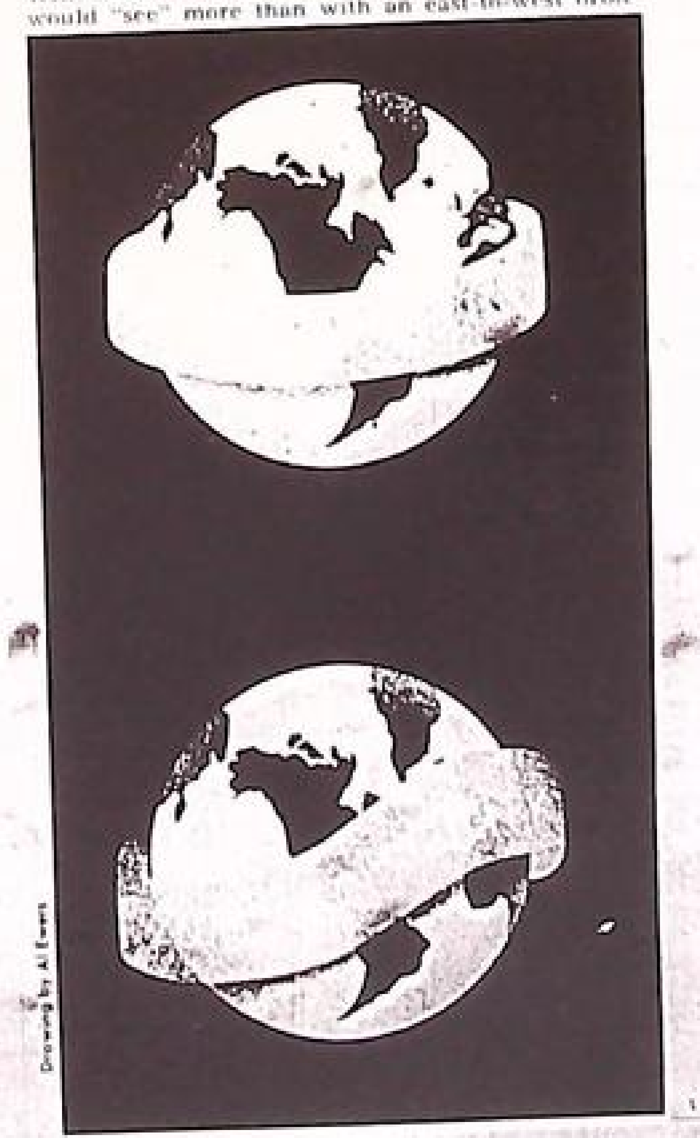
That altitude is not a great deal less than the altitude that would have to be reached to keep a rocket satellite in the sky. At 250 miles,

(Continued on next page)

a TV camera. If sent up in right direction and given enough speed to circle earth several times a day, TV rocket would be able to scan most of inhabited areas of earth, warn of enemy concentrations.



With orbit at a 45-degree angle to the equator, rocket would "see" more than with an east-to-west orbit.



Drawing by Al Ewers

equipped with TV would be invaluable. A meteorologist, watching a TV transmission from a rocket, would get a far better insight into the weather brewing over large areas than he could from the customary weather map, which needs many weather stations and many hours of work to assemble. He might miss some fine details somewhere, but his over-all picture would be much better.

Rocket Would Aid Navigation

These are just some of the vast military possibilities of an orbital rocket today.

For peacetime purposes, the satellite rocket offers still other possibilities. Equipped with scientific instruments, it could give us valuable material on conditions in interplanetary space near the earth. It would be invaluable in navigation, for its position at any given time would be known exactly; this would make it possible for ships and civil planes to get precise "fixes." And, equipped with a TV camera, a man-made satellite might even be a substitute for the iceberg patrol.

With further research and experimentation, an orbital rocket holds the promise of almost unlimited uses in both peace and war.

But right now, almost nothing except the job of putting one together stands in the way of having a man-made satellite. Rocket experts are no longer theorizing about one. They are already considering design detail—thinking in terms of weight quotas and desired speeds.

To put an artificial satellite into space, the experts know, would require a rocket weighing some 110 tons at take-off and standing about 70 feet high. The most massive rocket so far, the ex-German A-4, better known as the V-2, stands over 46 feet high and weighs around 12½ tons.

This may seem to leave us with a long way to go. But near the end of the war, the Germans already were drawing plans for a rocket standing around 60 feet high and weighing some 85 tons. The required size for an orbital rocket begins to look more or less like a real possibility when you know this.

That figure of 110 tons does not mean that the rocket that gets into space would weigh that much. It would weigh only about 1000 pounds, or half a ton. The difference of 109½ tons is what would be needed to lift that half ton against the earth's gravity through the atmosphere and provide it with the necessary speed to stay in space.

Once in its orbit, the half-ton rocket would neither "fall down" nor need any fuel to remain where it is. It would behave just like our natural satellite, the moon. This shows no inclination to fall on our heads and does not need fuel to keep itself going. The reason is that the speed at which the moon moves in its orbit creates just enough centrifugal force to counterbalance the earth's gravity at that distance.

For the moon, at a distance of 239,000 miles, a velocity of ⅔ of a mile per second is enough to establish equilibrium. Moving so slowly, as cosmic velocities go, the moon needs about a month to go around the earth once. If it were farther away, it could be still slower in its orbit. But if it were closer, it would have to speed up to remain a satellite.

At a distance of 22,300 miles, for example, the moon would have to move at about 2 miles per second and would get once around the world in 24 hours. At a distance of slightly over 1000 miles, it would have to travel at 4.4 miles per second and race around the earth in two hours. And if it were low enough just to clear the highest mountains in its path (an impossibility in reality, of course, because of air resistance), it would have to move at a speed of 5 miles per second and swing around the earth once in a little over one hour, 20 minutes.

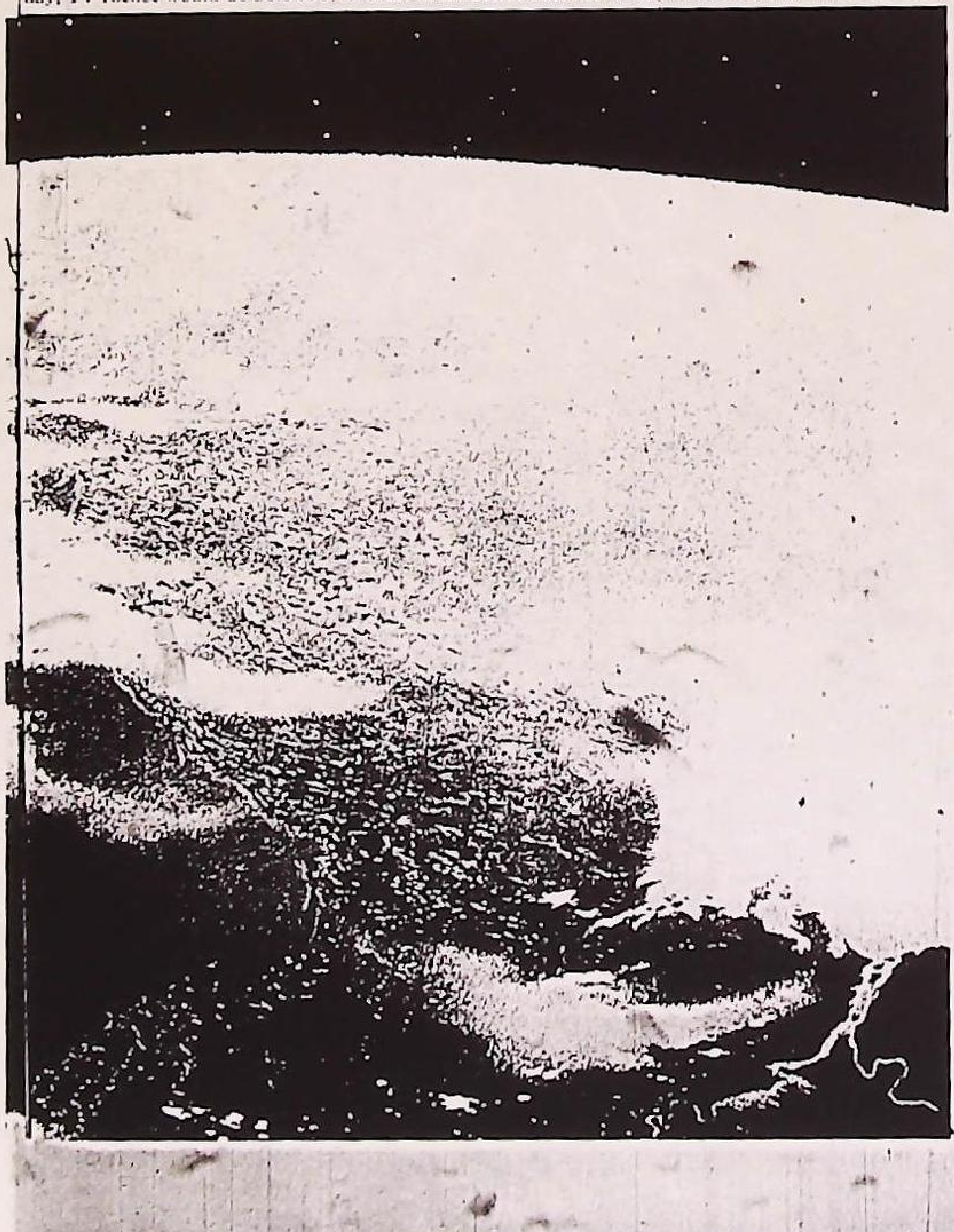
These facts about our natural satellite, which astronomers have no trouble in calculating, also hold true for a man-made satellite. Our first problem, then, has been to find out just how high a useful artificial satellite should be.

Naturally, it must be above the atmosphere of the earth or else air resistance would cause it to crash after a few revolutions. The highest a rocket has reached so far is 250 miles, a feat that was accomplished for the first time on February 24, 1949, from the White Sands Proving Ground in New Mexico.

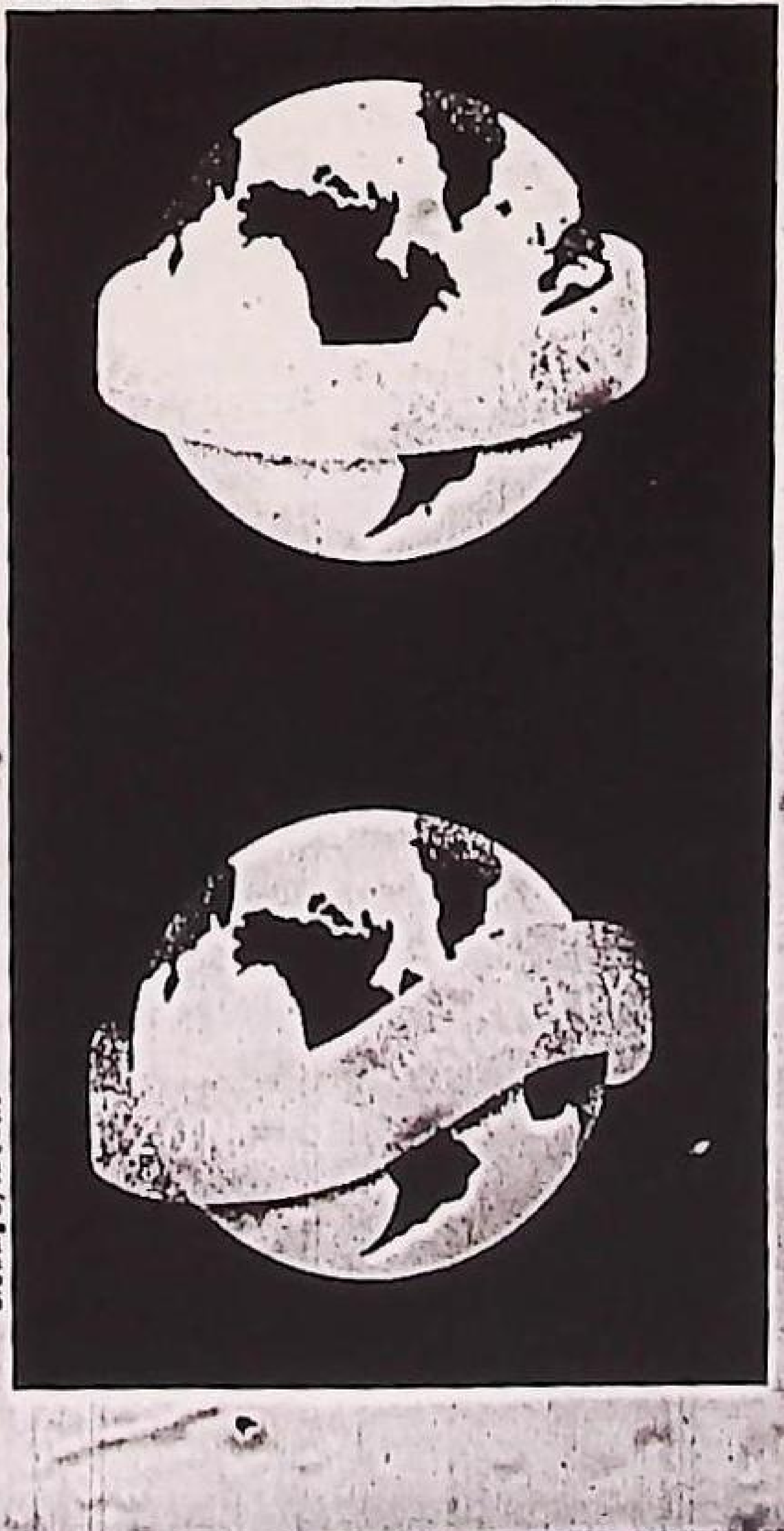
That altitude is not a great deal less than the altitude that would have to be reached to keep a rocket satellite in the sky. At 250 miles,

(Continued on next page)

a TV camera. If sent up in right direction and given enough speed to circle earth several times a day, TV rocket would be able to scan most of inhabited areas of earth, warn of enemy concentrations.



With orbit at a 45-degree angle to the equator, rocket would "see" more than with an east-to-west orbit



Drawing by Al Evers

the "air" is so thin that the number of air molecules per cubic inch is less than the number of air molecules in the best vacuum we can produce in a laboratory on the ground. And a satellite rocket circling at that altitude would stay up there for quite some time, although eventually it would crash because air resistance would slowly, in the course of many months, cause it to lose velocity. The reason that no rocket fired that high has stayed up for a time is that it has followed a vertical course and has not had the horizontal movement needed to counteract gravity when its fuel was exhausted.

How much farther would we have to go, then, to get a rocket completely out of the atmosphere and keep it circling forever? Not a great deal farther. A hundred miles above the highest point reached so far would do it. And that today is quite possible.

It could be done by using a trick that has already been tried out. It is a trick by means of which the altitude of 250 miles was reached on February 24, 1949. The rocket which climbed to the fringes of the earth's atmosphere was not a single rocket; it was what rocket engineers call a step rocket. In that particular case, it was an ex-German V-2, carrying as its "pay load" an American-made rocket of the type known as "WAC-Corporal."

The V-2 took off vertically in the slow and stately manner of a large rocket, then moved faster and faster until, after 65 seconds, it had used up its eight tons of fuel and had reached an altitude of 20 miles. At that moment, it was going at a rate of almost one mile per second.

Second Step Takes Off

Just before the fuel supply of the V-2 gave out, the WAC-Corporal lifted itself out of the bigger rocket. The V-2, although no longer under power, kept climbing, since it had a very considerable velocity, and reached an altitude of about 100 miles. But the WAC-Corporal, having added its own velocity of about half a mile per second to the mile per second it had been handed by the V-2, raced ahead and coasted to a peak altitude of 250 miles. It reached that point at about the time the larger "lower step" was about to crash on the proving ground.

To give a rocket enough velocity to take up an orbit around the earth, at about 350 miles altitude, a three-step rocket would be required. You can visualize this by imagining the two-step rocket of 1949 placed on top of a still bigger rocket.

The whole would be fired vertically, as usual, because a large rocket cannot take off at a slant. After the take-off, it would continue to rise vertically at first and then be tilted in the direction in which the satellite is to travel. The mechanism that does this tilting, and does it accurately, is already in use.

At about 30 miles' altitude, the first step would be almost exhausted but would be going at a rate of better than a mile per second. Then the second step would lift out, going faster and faster and tilting still more in the direction the satellite is to take.

By the time the first step crashed—or, rather, was destroyed in the air some 100,000 feet above the ground so that it wouldn't crash in one piece—the third step would be ready to lift out of the second. And by the time the second step crashed or was destroyed near the earth, some 800 or 900 miles from the take-off point, the third step would be in its orbit some 350 miles above sea level.

Its speed at that altitude (the precise figure is 346 miles) would be 4.7 miles per second, which would swing the satellite around the earth forever once every 96 minutes. That happens to be a figure that fits neatly into our 24-hour day. Such a satellite would make 15 complete revolutions per day.

The number of revolutions a satellite made a day would not be important, however. It would be about as valuable for it to make 12, 14 or 18 revolutions per day. What would be important would be for the orbital rocket to make a given number of complete revolutions each day. That would mean that the rocket would be vertically over a certain point, say Kansas City, every day at precisely the same instant—a most practical advantage for navigational and other purposes.

Just as important would be the direction in which the man-made satellite raced around the earth. If one fired a rocket from a mountaintop in Ecuador so that it sped around our planet above the equator, the result would be an interesting experiment of little practical use.

The reason is that a satellite rocket, at the comparatively low altitude of 350 miles and traveling along the equator, could be observed by only a small number of people. It would be visible only to those living in the tropics but could not be seen from anywhere else.

There is no reason, however, why an orbital rocket should have to circle the earth over the equator. The orbit could just as well be slantwise.

Effect of Slanting Orbit

If the rocket's orbit and the equator formed an angle of 45 degrees, the rocket would seem to move from the equator to the 45th parallel in the north (New York City is about on the 41st parallel), then go south again, cross the equator and continue south to the 45th parallel in the Southern Hemisphere. The motion of the rocket and the turning of the earth around its axis would combine to form a number of S curves.

On one of these S curves, the rocket, coming from the equator over the Pacific Ocean, would appear over the North American Continent above the Los Angeles area, slant across Arizona and Colorado, passing over Denver, and continue over Omaha, Neb., and on across Lake Huron to leave America over the Maine coast.

Later, it would appear over the Canary Islands and slant across French West Africa, Nigeria, the Belgian Congo, northern Rhodesia and Portuguese East Africa. Then it would pass just south of Madagascar and later veer north again and appear over the Asian mainland.

In the course of a single day, the rocket would be vertically or almost vertically over every point of the earth between the 45th parallel in the north and the same parallel in the south and would be visible from any inhabited point except Alaska, Greenland, and northernmost portions of Scandinavia and parts of northern Siberia.

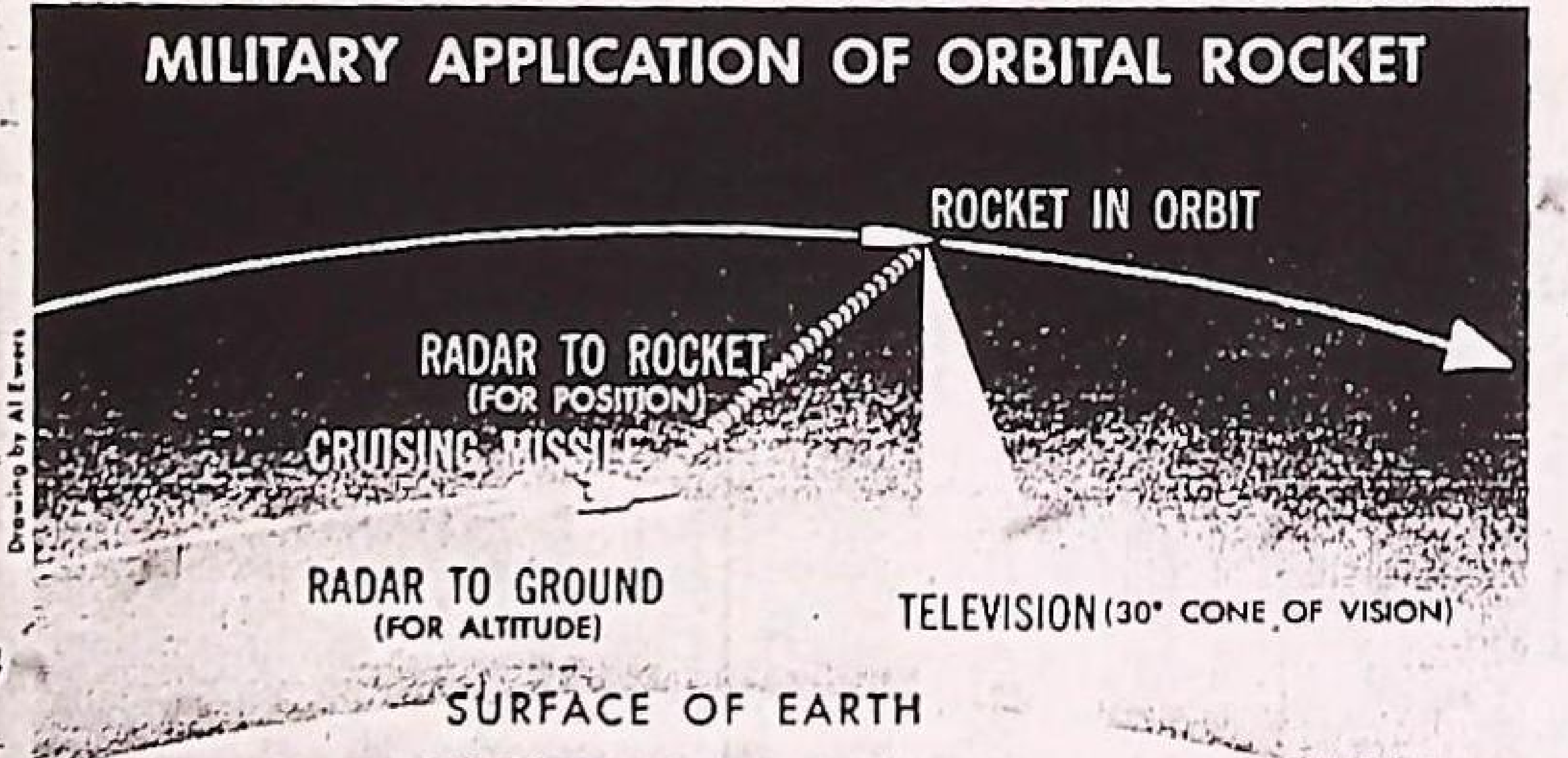
What would the artificial satellite look like?

Although the third step of the rocket forming the satellite would not be very large, it would appear as a very brilliant star visible to the naked eye. It would be impossible to confuse it with any other star, for it would move perceptibly, covering the arc from horizon to horizon in about 20 minutes.

But it would be visible only at dawn or dusk, when it would gleam with the reflection of the sun's rays. It would be invisible at night because the rocket would be in the shadow of the earth. Nor could it be seen during the day; it would be invisible then against the blue of the sky. At those times, however, it could still be spotted, of course, by radar.

The only step needed to build such an orbital rocket is the adaptation of techniques in use right now. It is mostly a question of en-

Rocket satellite would serve vital function in long-range guided-missile warfare. Using radar, guided missile could get "fix" from satellite as well as check its altitude, correct course accordingly.



Drawing by Al Ewers

A STATION IN SPACE

to refuel rockets on way to Mars is next step after satellites

A STATION IN SPACE

to refuel rockets on way to Mars is next step after satellites

the "air" is so thin that the number of air molecules per cubic inch is less than the number of air molecules in the best vacuum we can produce in a laboratory on the ground. And a satellite rocket circling at that altitude would stay up there for quite some time, although eventually it would crash because air resistance would slowly, in the course of many months, cause it to lose velocity. The reason that no rocket fired that high has stayed up for a time is that it has followed a vertical course and has not had the horizontal movement needed to counteract gravity when its fuel was exhausted.

How much farther would we have to go, then, to get a rocket completely out of the atmosphere and keep it circling forever? Not a great deal farther. A hundred miles above the highest point reached so far would do it. And that today is quite possible.

It could be done by using a trick that has already been tried out. It is a trick by means of which the altitude of 250 miles was reached on February 24, 1949. The rocket which climbed to the fringes of the earth's atmosphere was not a single rocket; it was what rocket engineers call a step rocket. In that particular case, it was an ex-German V-2, carrying as its "pay load" an American-made rocket of the type known as "WAC-Corporal."

The V-2 took off vertically in the slow and stately manner of a large rocket, then moved faster and faster until, after 65 seconds, it had used up its eight tons of fuel and had reached an altitude of 20 miles. At that moment, it was going at a rate of almost one mile per second.

Second Step Takes Off

Just before the fuel supply of the V-2 gave out, the WAC-Corporal lifted itself out of the bigger rocket. The V-2, although no longer under power, kept climbing, since it had a very considerable velocity, and reached an altitude of about 100 miles. But the WAC-Corporal, having added its own velocity of about half a mile per second to the mile per second it had been handed by the V-2, raced ahead and coasted to a peak altitude of 250 miles. It reached that point at about the time the larger "lower step" was about to crash on the proving ground.

To give a rocket enough velocity to take up an orbit around the earth, at about 350 miles altitude, a three-step rocket would be required. You can visualize this by imagining the two-step rocket of 1949 placed on top of a still bigger rocket.

The whole would be fired vertically, as usual, because a large rocket cannot take off at a slant. After the take-off, it would continue to rise vertically at first and then be tilted in the direction in which the satellite is to travel. The mechanism that does this tilting, and does it accurately, is already in use.

At about 30 miles' altitude, the first step would be almost exhausted but would be going at a rate of better than a mile per second. Then the second step would lift out, going faster and faster and tilting still more in the direction the satellite is to take.

By the time the first step crashed—or, rather, was destroyed in the air some 100,000 feet above the ground so that it wouldn't crash in one piece—the third step would be ready to lift out of the second. And by the time the second step crashed or was destroyed near the earth, some 800 or 900 miles from the take-off point, the third step would be in its orbit some 350 miles above sea level.

Its speed at that altitude (the precise figure is 346 miles) would be 4.7 miles per second, which would swing the satellite around the earth forever once every 96 minutes. That happens to be a figure that fits neatly into our 24-hour day. Such a satellite would make 15 complete revolutions per day.

The number of revolutions a satellite made a day would not be important, however. It would be about as valuable for it to make 12, 14 or 18 revolutions per day. What would be important would be for the orbital rocket to make a given number of complete revolutions each day. That would mean that the rocket would be vertically over a certain point, say Kansas City, every day at precisely the same instant—a most practical advantage for navigational and other purposes.

Just as important would be the direction in which the man-made satellite raced around the earth. If one fired a rocket from a mountaintop in Ecuador so that it sped around our planet above the equator, the result would be an interesting experiment of little practical use.

The reason is that a satellite rocket, at the comparatively low altitude of 350 miles and traveling along the equator, could be observed by only a small number of people. It would be visible only to those living in the tropics but could not be seen from anywhere else.

There is no reason, however, why an orbital rocket should have to circle the earth over the equator. The orbit could just as well be slantwise.

Effect of Slanting Orbit

If the rocket's orbit and the equator formed an angle of 45 degrees, the rocket would seem to move from the equator to the 45th parallel in the north (New York City is about on the 41st parallel), then go south again, cross the equator and continue south to the 45th parallel in the Southern Hemisphere. The motion of the rocket and the turning of the earth around its axis would combine to form a number of S curves.

On one of these S curves, the rocket, coming from the equator over the Pacific Ocean, would appear over the North American Continent above the Los Angeles area, slant across Arizona and Colorado, passing over Denver, and continue over Omaha, Neb., and on across Lake Huron to leave America over the Maine coast.

Later, it would appear over the Canary Islands and slant across French West Africa, Nigeria, the Belgian Congo, northern Rhodesia and Portuguese East Africa. Then it would pass just south of Madagascar and later veer north again and appear over the Asian mainland.

In the course of a single day, the rocket would be vertically or almost vertically over every point of the earth between the 45th parallel in the north and the same parallel in the south and would be visible from any inhabited point except Alaska, Greenland, and northernmost portions of Scandinavia and parts of northern Siberia.

What would the artificial satellite look like?

Although the third step of the rocket forming the satellite would not be very large, it would appear as a very brilliant star visible to the naked eye. It would be impossible to confuse it with any other star, for it would move perceptibly, covering the arc from horizon to horizon in about 20 minutes.

But it would be visible only at dawn or dusk, when it would gleam with the reflection of the sun's rays. It would be invisible at night because the rocket would be in the shadow of the earth. Nor could it be seen during the day; it would be invisible then against the blue of the sky. At those times, however, it could still be spotted, of course, by radar.

The only step needed to build such an orbital rocket is the adaptation of techniques in use right now. It is mostly a question of en-

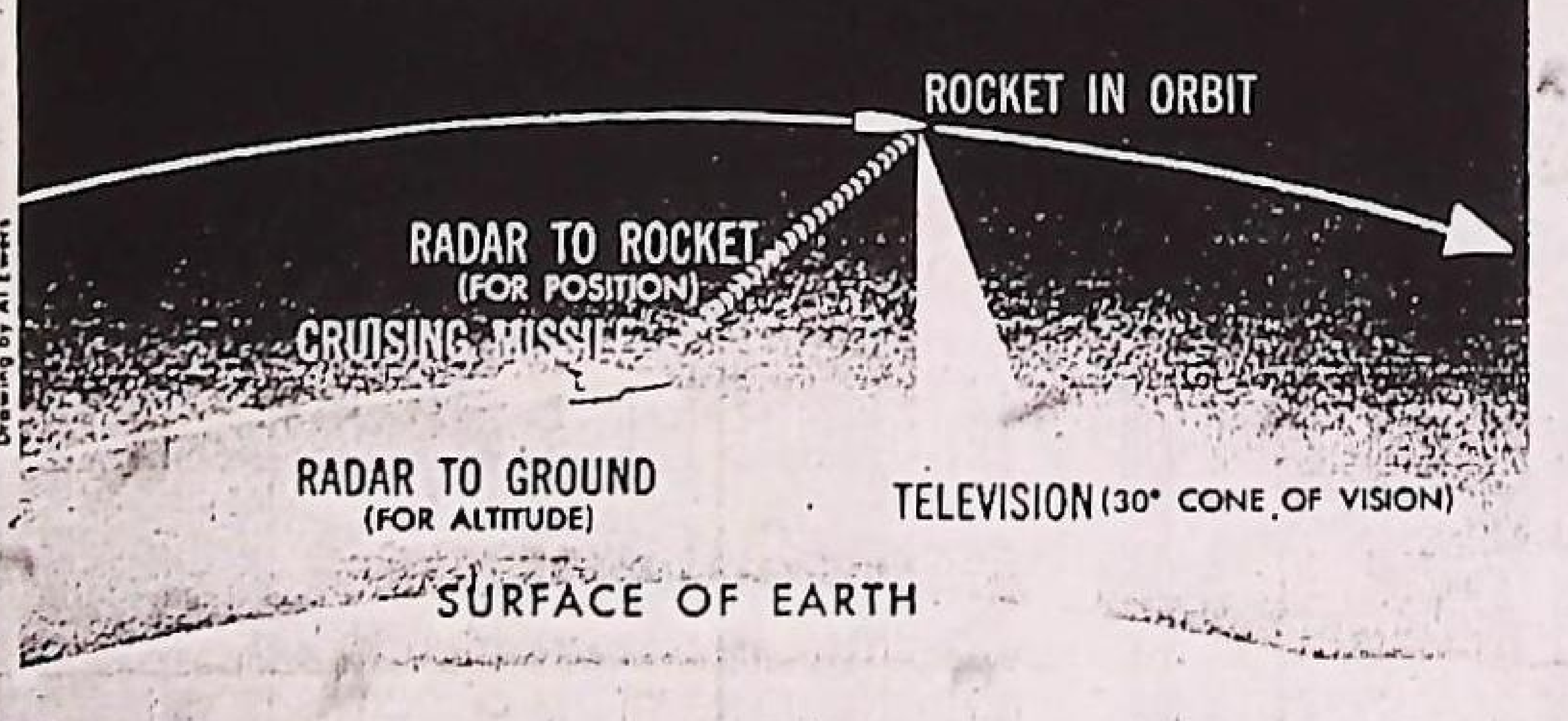
larging on
Of co
instrument
such equip
after a tim
nishing th
teries. To
long time
an atomic-
What
Well
rocket wil
tering to
would run
This "circu
would co
would not
to see all
ful in its
navigation
One t
it has bee
bombs int
them dro
scheme so
but it is n
In th
to make
a specific
one natio
will put
sooner or
to explod
third plac
of rocket
it is far ch
necessary
out of the

Pos

In ti
rocket w
manned s
and large
build a la
sent up f
human ob
ter perfor
even the
be able t
space con
to accumu
from whi
earth can
It ma
but it is a
astronomi
trip to Ma
easier tha
station. T
rocket shi
station.
Puttin
a trip to a
ect; that t
is a difficu
difficult, b
the station
There
however,
rocket in
thus, the
in the conq
And t
eminently
preferably,

Space
Mars

Rocket satellite would serve vital function in long-range guided-missile warfare. Using radar, guided missile could get "fix" from satellite as well as check its altitude, correct course accordingly.



Drawing by Al [illegible]

larging on and refining what has been done.

Of course, if a TV camera and scientific instruments were placed in a satellite rocket, such equipment would be unable to function after a time if there were no better way of furnishing the necessary power than with batteries. To keep such equipment working for a long time would require a new invention like an atomic-energy power source.

What of the future possibilities?

Well, the next thing after the first orbital rocket will probably be a second one, not differing too much from the first except that it would run in a different orbit, across the poles. This "circumpolar" rocket, as it has been called, would cover those areas that the first rocket would not pass over. It would make it possible to see all of the earth, but it would be less useful in its other applications, especially for navigational purposes and for missile guidance.

One thing that will not be done, although it has been discussed by some, is to put atomic bombs into orbits around the earth and to have them drop on specific targets in a war. This scheme sounds both intriguing and frightening, but it is not practicable.

In the first place, it would be very difficult to make a rocket returning from an orbit hit a specific place by remote control. Second, if one nation succeeds in building rockets that will put bombs into space, another nation sooner or later will succeed in building rockets to explode those bombs where they are. In the third place, since it needs about a hundred tons of rocket to put half a ton of bomb into space, it is far cheaper to transport the bomb over the necessary distance without lifting it all the way out of the atmosphere.

Possibilities of Space Station

In time, however, the unmanned orbital rocket will certainly be followed by the manned space station. As rockets grow larger and larger, it will finally become possible to build a large station from the parts of rockets sent up for this purpose. Then there can be human observers in space, capable not of better performance but of better judgment than even the best instruments. Then scientists will be able to perform experiments under free-space conditions. Then, too, it will be possible to accumulate a fuel reserve in such a station from which a rocket that has come from the earth can be refueled.

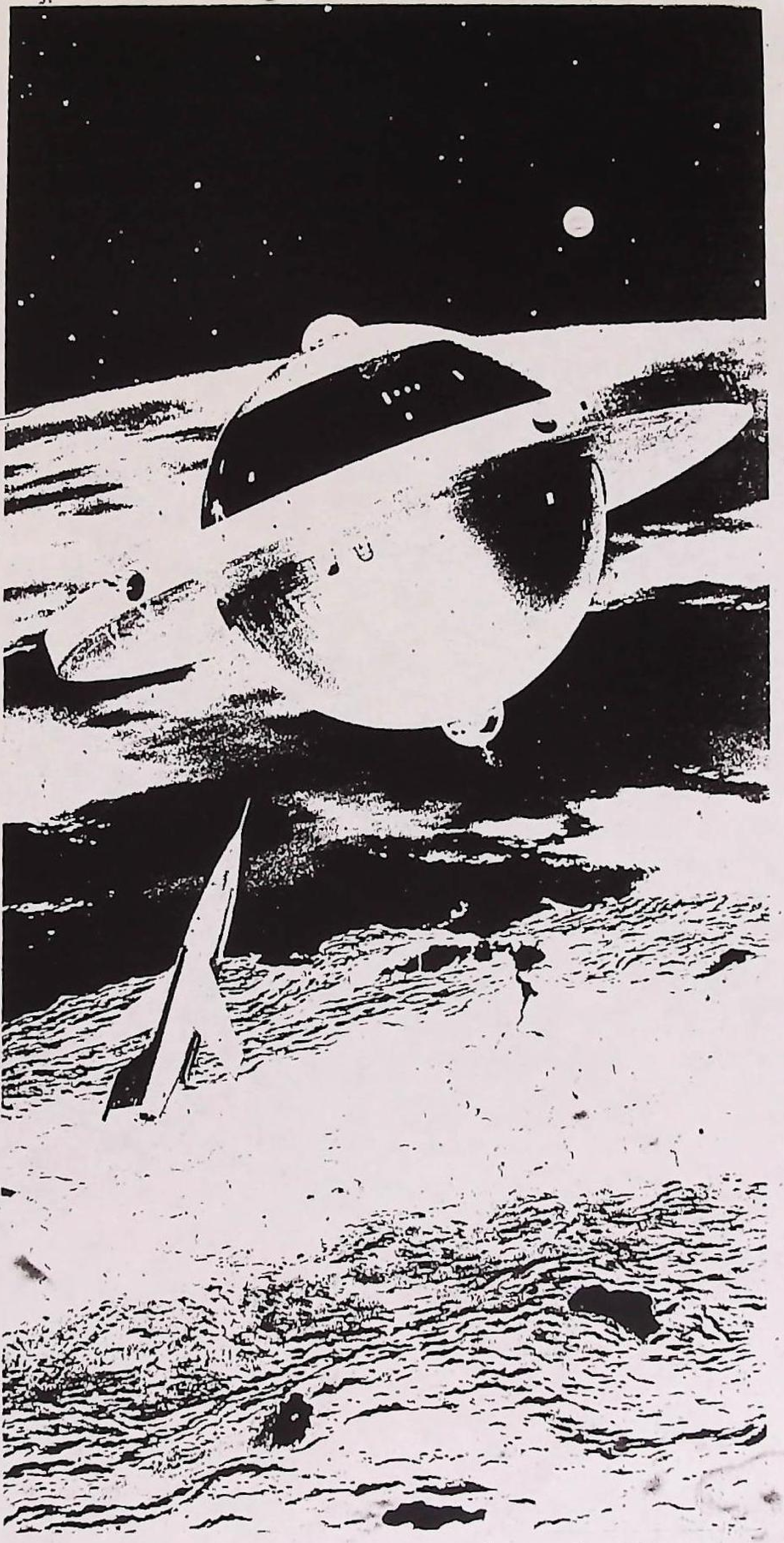
It may sound incredible at first hearing, but it is a hard fact, which can be backed by astronomical calculations at any time, that a trip to Mars from a space station would be far easier than a trip from the ground to a space station. There is only one provision: that a rocket ship can replenish its fuel supply at the station.

Putting it another way, one may say that a trip to another planet is a most difficult project; that the establishment of a space station is a difficult project too, though not quite so difficult; but that a trip to another planet from the station, once it exists, is actually easy.

There can be no space station in the future, however, if it is not preceded by an orbital rocket in the near-present. By simple logic, thus, the orbital rocket must be the first step in the conquest of space.

And that step can be made now, serving eminently useful purposes by itself—for peace preferably, for war if necessary.

END



Space station like this to refuel ships going to Mars will be possible as size of rockets grows.

Science Digest Oct 1946 Vol 20 #4

SCIENCE DIGEST
VOL. 20, #4
OCTOBER 1946

posed to extend into the air. She didn't say how the boy was to vanish—as always.

An expert hypnotist killed the theory that mass hypnotism was used; he said that a crowd could not be hypnotised. Then someone for the defense said he had seen the trick performed. But it was in a narrow street, the houses on each side having verandahs. The performer used fuel which caused a smoke screen so it wasn't possible to see the top of the rope. The conditions were not in accordance with the rules.

Another man said he had seen the trick but had arrived late when the rope was already extended.

Several Indian Army officers offered large rewards to anyone who would come forward to perform the illusion—but the money remained intact. So the mystery was left—still unsolved. The conclusion must be—"unproven."—Francis White in *The Listener* (London)

❦

Why Modern Man Has an Aching Back

THE PENALTY which modern man pays for his strong mind may be a weak back, suggests Dr. Clarence A. Splithoff in a report to *The American Journal of Surgery*.

When man assumed the upright posture, he not only set himself apart from the animal kingdom, but he also set the stage for a series of low back ailments which have plagued him since, Dr. Splithoff said.

No other part of the skeleton is more subject to failure or deviation in development, the report explained, probably because the evolutionary process is still continuing—aimed at a gradual strengthening of the bones of the lower back so as to support the greater stress of erect posture.

The spinal column of an infant is similar to that of primates such as the chimpanzee—practically straight and not very strong. And even though the lower spine elongates with growth, and becomes somewhat stronger, it apparently never develops sufficiently to prevent the numerous aches and pains from which modern man suffers.

✣

ONE OF THE ODDEST medical remedies ever conceived in the superstitious Middle Ages, was "weapon salve." When a person was wounded, the weapon which had inflicted the wound was anointed with "weapon salve," and then bandaged and cared for as carefully as if it were flesh and blood. The theory behind this practice was that there existed a peculiar magnetism between the weapon and the wound, and if the weapon were nursed the wound would heal. One disadvantage of weapon salves was that the weapon which inflicted the wound was often unobtainable.—*American Journal of Pharmacy*.

Hunting Africa's Unknown Animals

Condensed from *The Toronto Star Weekly*

Willy Ley

A CENTURY AGO a noted French scientist, Baron de Cuvier, stood before the French Academy and solemnly told its members that new zoological discoveries could be made only by delving into our planet's past.

The earth's crust doubtless harbored the fossil remains of countless extinct animals still unknown to science, he said. But as for living animals, he added dogmatically, there were no further important living animals left to discover.

The amazing thing is that he was right for some three-score years and more. Fossil hunters won fame by unearthing the most incredible collections of extinct saurians and mammals. But no hunter of living animals returned from anywhere with astonishing news.

New butterflies and lizards from South America—yes. Some new rodents and small marsupials from Australia—yes. A lot of small and sometimes very interesting fishes from the bottom of the ocean and from obscure inland rivers, especially in the tropics—yes.

But nothing that would spill over from professional literature into the sea of daily newsprint and make an audible splash. Zoologists felt inclined to agree with Cuvier wholeheartedly.

The single real important discovery made during those decades from about 1820 to about 1890, the finding of the Australian lungfish, did not get the attention it deserved until near the end of the century. And it was just at that time that new facts began to show how careless Cuvier had been.

The new century ushered in a series of very remarkable discoveries of new animals—and the skeptical attitude became more and more conciliatory as time went on and new discoveries kept coming in.

As regards the existence of undiscovered animals even now, well over a dozen decades after Cuvier, zoologists are inclined to be open-minded. They know that about 10 percent of the land surface of the earth—not even including Antarctica—is still virtually or completely unexplored.

A lot can be in hiding in that 10 percent. They know that the oceans still harbor not only one but many mysteries—the accidental discovery (in 1938) of a fish believed to be extinct for more than 65,000,000 years taught a lesson.

Zoologists specializing in the animal trade are even more lenient. They point at certain spots on the

---

From the May 18, 1946 issue of *The Toronto Star Weekly*.

globe and voice suspicions. Sumatra, for example, is known to harbor a "new" variety of rhinoceros, in addition to the well known type. Specimens have even been shot, but never under circumstances which permitted a complete scientific investigation.

New Guinea is said to be the home of a large marsupial, and Burma is believed to harbor a variety of deer, black in color and reported to have a strange call curiously resembling the barking of a dog. Even Europe may still boast an undiscovered animal in the Swiss and Austrian Alps, described as a large and very rare lizard.

But the "promised land" for still undiscovered animals is Africa. More precisely, it is the equatorial belt of Africa, stretching roughly 2,000 miles across the continent and extending for about 1,000 miles on either side of the equator. It is the Rainy Forest in that equatorial belt on which suspicion has been focussing for the last 40 years.

It is this territory which still harbors a number of "mystery animals," dimly known to science through incomplete—and not invariably trustworthy—reports. It is this section which has produced four major zoological discoveries within three decades.

The first was the okapi, a short-necked relative of the giraffe. First rumors of its existence reached the civilized world in about 1890 when Sir Henry Stanley, reporting on one of the pygmy tribes of the Congo region, stated that they had a word "atti" which meant "donkey" and that such "attis" were occasionally caught in pits.

To experts this statement was rather mysterious. No donkey was known from that section. It might be one of the zebras, but zebras avoid forests and those pygmies lived where the forest was densest and most inhospitable.

Sir Harry Johnston decided that it was either a variety of zebra which did not mind forest environment, or else an unknown animal more or less resembling a donkey.

He set out to investigate . . . and now the books state that "Sir Harry Johnston discovered the okapi in the Congo forest in 1900."

At first it was believed to be a new variety of zebra, but when two complete skins and a skull reached London, the novel fact of a surviving short-necked giraffe was established and the Negro name okapi was officially adopted.

The range of the okapi is in the northeastern corner of the Rainy Forest. This region is called the Ituri Forest—and the Ituri Forest, the natives said, harbored an enormous wild hog, black in color and as big as a small rhinoceros.

The ferocious forest hog of the natives remained a riddle for a full quarter of a century. Then it found its solution, and the solution was simple: the animal existed. Capt. R. Meinertzhagen of the British East African Rifles discovered it in 1904, securing an imperfect skin that had come from the forest of Mount Kenya. He also obtained a skull from the forest bordering Victoria Lake.

The animal is now known scientifically as "Hylochoerus." While not actually as large as a small rhinoceros it is by far the largest of the wild pigs of Africa and its fur is actually jet-black.

Like the okapi it represents a form otherwise extinct and belonging to former periods of earth's history.

The discovery that there was a Liberian variety, seemed to solve another old zoological puzzle. In 1688 a Dutchman, Dr. Dapper, wrote a ponderous description of the Liberian coast, and mentioned three varieties of wild hogs occurring there. Two were quite ordinary, but the third was unknown.

Somebody guessed that Dr. Dapper's mysterious black hog was the same animal which had been described in 1844 by a U. S. physician, Dr. Samuel G. Morton. All that Dr. Morton had to go by was the statement that the animal looked like a large pig, but he had a complete skull of that animal.

From the skull Dr. Morton established that the "big pig" was actually a relative of the hippopotamus, but of smaller size, "only" about six feet long. He called it "Choeropsis"; popular books referred to it as "pygmy hippo," it was believed that the animal was extinct.

But rumors about "large pigs" kept coming from Liberia. Some obviously referred to Hylochoerus, others sounded much more like Choeropsis. But Choeropsis was extinct!

About 1909 the rumors became too plentiful and Carl Hagenbeck in Germany finally sent his best man, Hans Schomburgk, to Liberia in order to find the real reason for all this talk.

Something was to be discovered there, either the "extinct" Choeropi or else something entirely new.

Every educated Liberian, colored or white, was fully convinced that Choeropsis was extinct. And the natives of the interior believed Schomburgk crazy, not because he was looking for this animal which they knew well, but because he wanted it alive. One could, with luck and sharp weapons, kill a "nigbve" (as they called it) but one could not catch it alive.

But one year later Schomburgk brought live pygmy hippos back with him.

While Schomburgk was going after Choeropsis, an expedition of the New York Zoological society, consisting mainly of Herbert Lang and Dr. James P. Chapin, was trying to get a live okapi for the Bronx Park zoo.

Though they were unsuccessful, all unknowingly they discovered a new bird. They brought native headdresses back with them and examination at home showed that one of the headdresses contained feathers of unknown origin.

For more than 20 years, Dr Chapin was haunted by the mystery of these unidentifiable feathers.

A chance discovery in a Belgian

museum in 1936, consisting of an examination of two wrongly labelled stuffed birds, furnished a clue. These unidentifiable feathers had come from an African peacock (later called "Afropavo congensis"), a so far completely unknown bird. All that remained to be done was to verify its actual habitat.

Dr. Chapin did this by flying to Stanleyville. Afropavo turned out to be well known to native hunters. It has a fairly restricted habitat, but is not excessively rare where it occurs. The habitat is, one is tempted to write "of course," the eastern edge of the Rainy Forest from the Ituri Forest down to the Sankuru river.

Even if there were no rumors left it would be an obvious question to ask whether the Rainy Forest might not harbor more unknown creatures. The rumors say that it does, and a good number of them look fairly substantial. Hans Schomburgk gathered quite a number of them when he was looking for Choeropsis and told me about them one night in Berlin, about a dozen years ago.

While asking questions about "large pigs," with the purpose of locating the haunts of the pygmy hippo, he fell in again and again with reports of a small mountain rhinoceros.

Now Schomburgk knew about Meinertzhagen's forest hog and that it had been termed "a small rhinoceros."

He also knew that a native, trying to be polite, will unhesitatingly affirm that there is, in Schomburgk's words, "a large animal with seven horns but only one eye and blue fur" if the interrogator shows inclinations to be told about such an animal.

So Schomburgk said, oh yes, and proceeded to describe the forest hog. To his great surprise the native hunters contradicted vigorously and told him in what respects the "mountain rhinoceros" differed from the black pig.

It was evident that the native hunters knew what they were talking about. Schomburgk came to the conclusion that the mountains of eastern Liberia actually harbor a small-size form of the rhinoceros. But so far the small "mountain rhino" has not been discovered.

Other rumors of the Rainy Forest deal with a cat the size of a leopard but of different habits; an animal called "too" which is described as goat-sized and black; and the so-called nandi bear, a bear-like animal which is said to be a forest dweller and a night prowler.

Various settlers have reported that this animal was occasionally killed by poisoned meat put out for hyenas, even photographs are said to have been taken, but so far the "nandi bear" has never been tracked down by a naturalist.

But the prize story of all the stories of unknown animals of equatorial Africa is that of the "dragon of the Congo Forest," the animal "mokele-mbembe" of the natives.

Though it seems much more fantastic at first glance than any of the other reports, it is actually one of the best documented. These other undiscovered animals are, after all, strange only because they are not yet known to science.

But the animal "mokele-mbembe" is described as a living dinosaur!

It is probably not a dinosaur in the zoological sense, but it is, in all probability, a large reptile. Schomburgk carried one of the tales about such an animal.

When he came to Lake Bangweolo, outside the limits of the Rainy Forest proper, he was surprised that hippopotami were lacking, although the lake was just such a body of water which would harbor hippopotami.

The natives had an explanation. The lake did not have hippopotami because it was inhabited by an animal which, although somewhat smaller in size, killed them.

There was also an old, old picture which could be taken to contribute evidence. That picture came from the Ishtar Gate of Babylon, erected, according to archaeological findings, by King Nebuchadnezzar.

To express the splendor of the great king, colored bas-reliefs of animals were imbedded into the walls, a long row of majestically walking lions along the procession way, and alternating rows of "rimi and sirrushu" on the gate itself. The "rimi" are wild oxen. The "sirrushu" are the "dragons" of Babylon.

The question now arises whether the sirrush is a mythical monster or whether the Babylonians pictured an animal with which they were familiar and we are not. Offhand it would seem strange that they should place a mythical monster between two existing animals —the lions and "rimi."

I think that, purely from the point of view of logic, the chances are even that the sirrush is the picture of an actually existing animal too. This assumption does not imply that this animal was frequent or even that it occurred near Babylon. On the contrary, it may have been given its place of honor just because it was a "strange beast from far lands."

In build the sirrush is strongly reminiscent of certain extinct dinosaurs, with a long neck, with forefeet resembling the paws of a mammal and hind feet looking like those of a bird.

It has a forked tongue like snakes and monitor lizards and apparently some flaps of skinny membrane at the head, very much like certain chameleons and other types of living reptiles.

It is described as having a long and muscular tail like an alligator. In size it is said to be intermediate between hippopotamus and elephant.

And there can be little doubt that Central Africa still harbors a large long-necked animal of some kind which shows a definite preference for an aquatic environment and which is, in all probability, a large reptile.

Ley, Willy. *Accident That Didn't Happen, The* (A), 10/59. *Africa's Mysterious Mammal* (A), 5/51. *Air on the Moon, The* (A), 10/60. *Ancestor of the Dinosaurs* (A), 3/53. *And Military Purchases* (A), 4/64. *And the Laws of Utter Chaos* (A), 6/66. *Animal in the Footnotes, The* (A), 10/56. *Another Look at Atlantis* (A), 6/67. *Another Look at Atlantis . . .* (R), 8/69. *Any Questions?* (A), 6/59. *Anyone Else for Space?* (A), 6/64. *Are We Going to Build a Space Station?* (A), 12/62. *Area of "Accessible Space," The* (A), 10/64. *Asteroid Roundup* (A), 11/54. *Astronautics International* (A), 12/67. *Atlantic's Missile Range, The* (A), 4/59. *Between Us and Space Travel* (A), 2/57. *Birth of the Space Station, The* (A), 4/53. *Birth of the Space Station, The* (A), 5/53. *Brownian Motion, Loschmidt's Number* (A), 6/66. *Carbon 14 and the Ice Age* (A), 4/52. *Case of the Lying Stones, The* (A), 4/54. *Cause of the Ice Age* (A), 12/52. *Century of Fossil Man, A* (A), 8/64. *Century of New Animals, A* (A), 2/58. *Closeup of Mars* (A), 7/54. *Collision Course* (A), 3/69. *Coming of the Robots, The* (A), 4/57. *Conquest of the Moon* (R), 5/54. *Dead or Alive?* (A), 12/59. *Deadly Trees, The* (A), 12/53. *Death of the Sun (Part 1)* (A), 3/55. *Death of the Sun (Part 2)* (A), 4/55. *Delayed Discovery, The* (A), 10/66. *Demotion of Pluto, The* (A), 8/56. *Devil's Apples, The* (A), 4/68. *Discovery of the Solar System, The* (A), 12/68. *Dragons and Hot-Air Balloons* (A), 12/61. *Dragons in Amber* (R), 5/51. *Drowned Civilization, The* (A), 4/69. *Earliest Robot, The* (A), 9/57. *Early Days of the Metric System, The* (A), 2/64. *Earth Tunnels* (A), 10/53. *Earth's Extra Satellites* (A), 2/62. *Elements of Khujut Rab'a & Ctesiphon* (A), 12/54. *End of the Jet Age, The* (A), 10/62. *Engineer's Dreams* (R), 10/54. *Epitaph for a Lonely Olm* (A), 2/68. *Essays* (R), 8/69. *Eugen Saenger and the Rocket-Propelled Airplane* (A), 7/69. *Exploration of Mars, The* (R), 12/56. *First Flight by Rocket Power* (A), 2/63. *First Spaceship, The* (A), 11/58. *Flying Saucers—Friend, Foe or Fantasy?* (A), 10/50. *For Your Information* (A), 3/52. *For Your Information* (A), 5/52. *For Your Information* (A), 8/63. *For Your Information* (A), 10/65. *For Your Information* (A), 8/69. *For Your Information* (A), 9/69. *For Your Information* (A), 10/69. *For Your Information* (A), 11/69. *Forerunners of the Planetarium* (A), 2/65. *Fuels Galore* (A), 6/60. *Fyr Gregeys and Wylde Fyr* (A), 1/56. *Galactic Giants, The* (A), 8/65. *Galton's Random Machine, the Bean Curve* (A), 4/64. *Great Pyramid Mysteries, The* (A), 3/57. *Healthfull Aromatick Herbe, The* (A), 12/65. *Hints to Future Archeologists* (A), 2/54. *Hollow Earth, The* (A), 3/56. *How Much Water?* (A), 2/55. *How of Space Travel, The* (A), 10/55. *How to Get Around on Other Planets* (A), 8/58. *How to Slay Dragons* (A), 8/60. *Hunting Down the Dodo* (S), 10/57. *Ice Age, The (II)* (A), 1/53. *Ice Age, The (III)* (A), 2/53. *IGY Roundup* (A), 7/58. *In Australia, the Rain . . .* (A), 8/68. *Interplanetary Communications* (A), 7/68. *Intractable Prime Number, The* (A), 6/53. *Is Artificial Life Possible?* (A), 11/53. *Island of Brazil, The* (A), 2/69. *Island of the Stone Heads, The* (A), 4/58. *Jules Verne, Busy Lizzy, and Hitler* (A), 6/68. *King of the Rats* (A), 10/63. *Konstantin Anklitzen Alias Friar Bertholdus* (A), 6/55. *Lands Beyond* (R), 11/52. *Last of the Moas, The* (A), 9/58. *Let's Build an Extraterrestrial!* (A), 4/56. *Let's Do Something About the Weather* (A), 2/61. *Life Without Gravity* (A), 1/58. *Mail by Rocket* (S), 8/54. *Man I Didn't Meet, The* (A), 8/61. *Man-Made Land, The* (A), 10/61. *Mars* (A), 11/52. *Martian Space Stations, The* (A), 9/53. *Max Valier and the Rocket-Propelled Airplan* (A), 5/69. *Meteoric Stream, The* (A), 9/51. *Midnight Marvels* (A), 5/55. *Missiles over the Sea* (A), 3/51. *Mission to a Comet* (A), 9/68. *Monsters of the Deep* (A), 2/59. *Moon Contract, The* (A), 7/57. *Moon Worm, The* (A), 12/60. *Mutant of the Iron Horse* (A), 6/56. *My Friend the Nautilus* (A), 11/68. *Names in the Sky* (A), 6/62. *Names of the Constellations, The* (A), 12/63. *News of Atlantis* (A), 6/58. *No Longer Imaginary* (A), 11/56. *Not Quite Perennial Phyllapod, The* (A), 8/55. *Observatory on the Moon, The* (A), 6/65. *Oldest Prediction, The* (A), 10/54. *On with the Dodo Hunt!* (A), 11/57. *One Planet—One Language* (A), 2/60. *Orbit of Explorer I, The* (A), 10/68. *Orbit of the Vanguard Satellite, The* (A), 3/58. *Orbital Satellite Vehicle, The* (A), 7/55. *Orbits of the Comets, The* (A), 4/67. *Other Side of the Moon, The* (A), 2/56. *Our Missile Arsenal* (A), 8/57. *Pangolin Is a Pangolin, A* (A), 8/67. *Project Vanguard* (A), 9/56. *Puzzle Called Gegenschein, The* (A), 4/61. *Rarest Animals, The* (A), 12/64. *Re-designed Solar System, The* (A), 4/66. *Remnants of the Sarmatian Sea* (A), 5/58. *Rockets, Missiles and Space Travel* (R), 10/51. *Rockets, Missiles and Space Travel* (R), 4/58. *Rotating Luminous Wheels in the Sea* (A), 8/62. *Salamanders and Other Wonders* (A), 1/56. *Scheherazade's Island* (A), 8/66. *Scientific Journey* (A), 8/53. *Second Trip to Venus* (A), 7/53. *Seven-Cornered Polygon, The* (A), 3/54. *Shape of Shells to Come, The* (A), 4/62. *Small Bodies near Heavy Planets* (A), 1/54. *Sound of the Meteors, The* (A), 12/66. *Sounding Rockets and Geoprobes* (A), 6/63. *Space Travel by 1960?* (A), 9/52. *Spaceship in the Basement, The* (A), 12/57. *Strait Named After Vitus Bering, The* (A), 6/61. *Strange Planet Next Door, The* (A), 12/58. *Supersonic Bot Fly, The* (A), 8/52. *Symbolically Speaking* (A), 4/65. *Too Much Imagination* (A), 4/63. *Top of the World* (A), 5/54. *Tracking down the Sea Serpent (Part 1)* (A), 12/56. *Tracking down the Sea Serpent (Part 2)* (A), 1/57. *Tribes of the Dinosaurs* (A), 6/57. *Twenty-Foot Miss* (A), 12/50. *Unveiling the Mystery Planet* (A), 9/55. *Wanted—Dead or Alive* (A), 5/56. *Welcome to Reality, C-T!* (A), 7/56. *What's Only Money?* (A), 4/60. *When Will Worlds Collide?* (A), 7/52. *Who Invented the Crossbow?* (A), 2/67. *Who'll Own the Planets?* (A), 5/57. *World of 2052, The* (A), 10/52. *Worst of All the Comets, The* (A), 10/67. *Wreck of La Lutine, The* (A), 2/66. *Written Word, The* (A), 1/69.

Life magazine. *World We Live In, The* (R), 6/56.

Natural History

Vol LXIX #7
August-Sept 1960

Waterville Inn

A Complete Mountain Resort

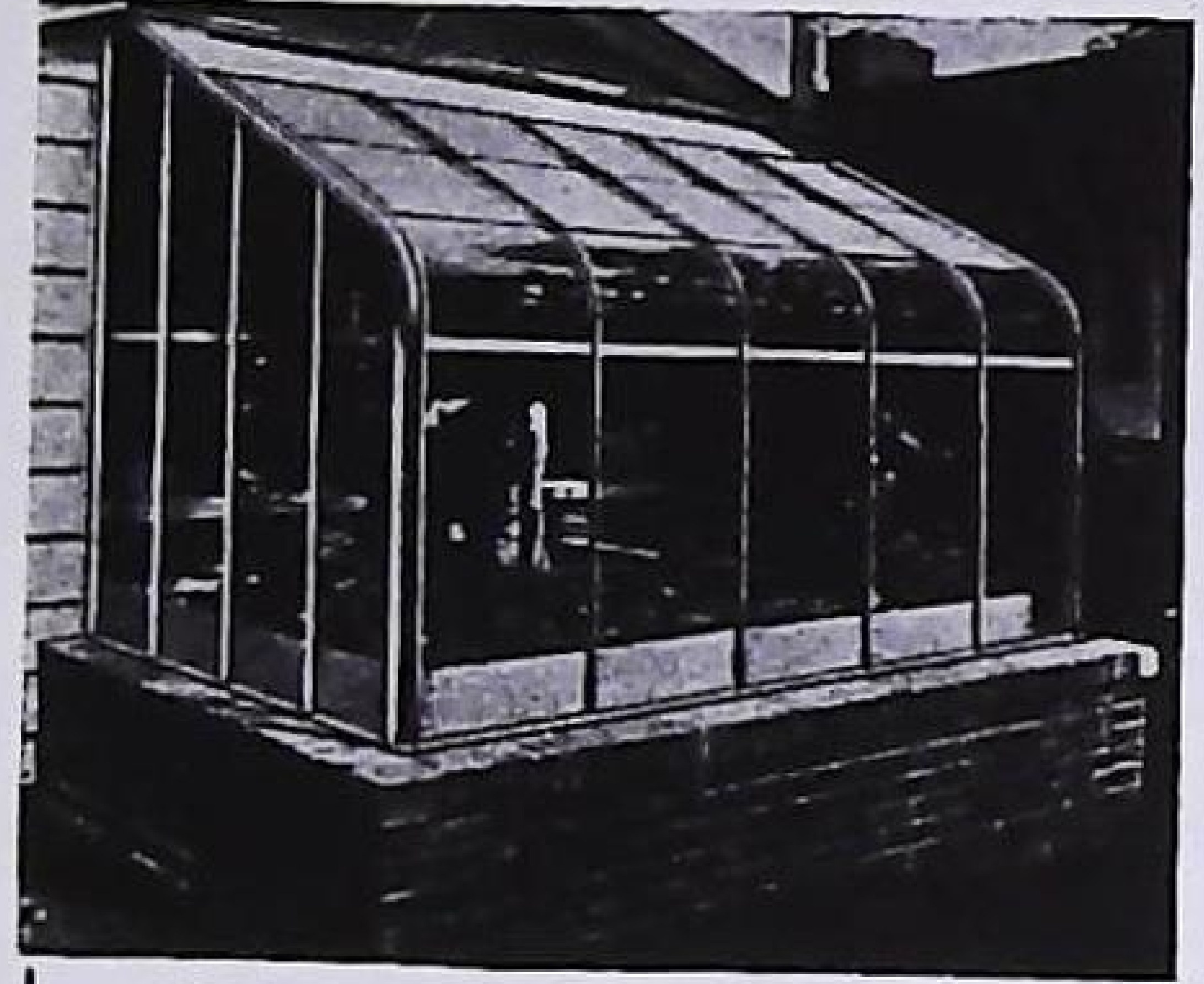
Secluded in a quiet valley entirely surrounded by the White Mt. Nat'l Forest. Wooded paths along the Mad River and miles of trails extend from the Inn to the mountain ponds and peaks. A comfortable Inn with private golf course, large swimming pool and tennis court complete the facilities of this fine resort.

Mid-June to mid-October and winter

Advance reservations requested.
Telephone Park 6-2011

WATERVILLE VALLEY
(Campton P. O.)
NEW HAMPSHIRE

Gardening Under Glass
a hobby for the entire family



Everlite Aluminum Greenhouses open an exciting new area of leisure enjoyment for flower lovers!

Models for all gardeners—large and small. Completely prefabricated. Easy to install. Easy to maintain. Priced from $187.50. Full line of accessories.

Your most rewarding hobby will be "living with flowers the year 'round".

Model B-4 illustrated above ($290)

Write for color brochure and price list NH80

Aluminum Greenhouses, Inc.
14615 Lorain Ave. • Cleveland 11, Ohio

suggest themselves are not allowed much importance. This is not an original essay or a thoughtful use of the facts, but a random borrowing. The reader is never quite sure as to the author's intentions, and while that may be part of the fun, the book seems to follow a hit-or-miss approach to some challenging material.

ADVENTUROUS ALLIANCE, The Story of the Agassiz Family of Boston, by Louise Hall Tharp. *Little, Brown, $5.00; 354 pp., illus.*

LOUISE HALL THARP has set out to write a domestic narrative. It is well told, from beginning to end, but if the period is re-created and brought close to contemporary readers, Agassiz himself remains intangible. Not that information is lacking about his life and fortunes: much is said about his personal force and his intellectual influence on American society. But the background is clearer than the man who stands in front of it.

THE CARE AND CULTIVATION OF INDOOR PLANTS, by Violet Stevenson. *Philosophical Library, $4.75; 159 pp., illus.*

A USEFUL, sturdily written little book designed to help the home owner see his favorite potted plants through the year. It gives thorough details as to proper treatment and placement, as well as advice on soil conditions and care of the sick. The photographs, regrettably, are uninspired.

SOUTHWEST GARDENING, by Rosalie Doolittle, in collaboration with Harriet Tiedebohl. *University of New Mexico Press, $5.00; 222 pp., illus.*

THIS book won a prize from the National Council of Garden Clubs, and in fact it is well printed and presented. However, the author introduces her subject with an irritating "flowers-as-pets" angle, goes on to assume a frequently fussy authority about the do's and don'ts of the business, and rather neglects the soil and weather conditions of the Southwest, although this is specifically a regional book. But all in all, what can be done with landscaping and gardening under the prevailing tions is simply explained, and the ture of individual plants exami some detail. A useful volume for about to dig in at Tucson or Taos.

BUTTERFLY FARM and ART MUSEUM
For sale: papered butterflies from all over the world; living ova, pupae and cocoons in season. Also beautiful art objects made from butterflies and shells. Free list. Exhibit open to October 15th. Tourists and summer guests also accommodated. Write for booklet to:
Max Richter, East Durham 5, New York

LIVE SILKMOTH COCOONS
Many species, both foreign and native. We supply specimens in lots of 100 for research institutions, etc., but especially welcome small orders. Write for free price list:
Bruce Feller
29 E. John Street, Lindenhurst, New York

THE STORY OF EARTH SCIENCE, by Horace G. Richards. *Lippincott, $3.75; 169 pp., illus.*

THE author is a geologist whose expressed intention was to write about earth science not so much for the very young as for the "slightly advanced." It is a beginner's book, then, but one which might be read with profit by an untutored adult. Useful guides are provided for the identification of common rocks, fossils, and minerals, and their general characteristics are clearly and simply described.

HIDDEN AMERICA, by Roland Wells Robbins and Evan Jones. *Knopf, $5.00; 259 pp., illus.*

AMATEUR archeology on a high level. Roland Wells Robbins, who has written this book in collaboration with Evan Jones, was the discoverer of the site of Thoreau's cabin on the shores of Walden Pond. He also directed the excavation of the colonial ironworks at Saugus, Massachusetts, and has sunk his probing rods into the soil over many other historic and prehistoric sites in this country. His book is honest and unpretentious, makes no unsubstantiated claims, and, as with the supposed traces of the Viking occupancy of Cape Cod, retains an intelligent skepticism. The photographs are well chosen.

SCIENCE IN PROGRESS, Eleventh Series, edited by Hugh Taylor. *Yale University Press, $7.50; 379 pp.*

THE latest in a very excellent series, whose contributions are based on the Sigma Xi lectures for 1957 and 1958. Of particular note in the present book are chapters on mountain building, by Armand J. Eardley; continental growth, by J. Tuzo Wilson; cosmic radiation, by Serge A. Korff; smoking and death rates, by E. Cuyler Hammond; and viruses and cancer, by J. W. Beard.

This list details the photographer, artist, or other source of illustrations, by page.

COVER—Lee Boltin
5—Courtesy University of Oklahoma Press
6-7—Courtesy John Wiley & Sons
8-19—Herman W. Kitchen
20-23—Ross E. Hutchins
24-35—Colin M. Turnbull
36—AMNH Archives
38-39—Star Map, after Henry M. Neely
40-45—Willis Peterson
46-47—Walter Dawn
48-49—Andrew Meyerriecks
50-51—Guy Tudor
52-53—Eric Hosking
54-55—Walter Dawn
56-57—Eric Hosking
62—Lee Boltin
64—U.S. Geological Survey, top; Lee Boltin, bottom
Third Cover—Lee Boltin

It might seem superfluous to suggest that a few more color plates would not have been amiss; but for the layman color is ordinarily of great value in identification. However, this criticism is not intended to detract from a book which provides excellent historical and descriptive information, as well as a great quantity of data about the location of gems.

100 INDOOR PLANTS, by A.C. Muller-Idzerda. *Emerson Books*, $2.95; 114 *pp., illus.*

THE 100 plants included in this little guide are a good, representative group, and the photographs that accompany their description and advice as to their care are well chosen. The book is simply but accurately written, and should be very useful for the tyro who wants plants in the house or apartment but needs a professional to help him plan.

FEATHERS AND FLIGHT, by Clarence J. Hylander. *Macmillan, $3.95; 214 pp., illus.*

HERE is a book for young readers that does not succumb to the temptation of talking down or over-simplifying. Excellent ornithological material is provided in a well-written, substantial text. Discussions of the physical characteristics of birds in general and, more particularly, of the relationship of many American species to their environment invite further exploration by the watcher in the field or by the student of biology.

THE SALT WATER AQUARIUM IN THE HOME, by Robert P. L. Straughan. *A. S. Barnes, $7.50; 252 pp., illus.*

THOSE who have long hesitated to start a salt water aquarium in the face of seemingly insurmountable odds will be somewhat reassured by this book. It *can* be done—but not without painstaking attention, and Mr. Straughan, an experienced aquarist and marine collector, brings the successful marine aquarium closer to possibility than it used to be. The book is a little expensive, but profusely illustrated.

WILLY LEY'S EXOTIC ZOOLOGY, by Willy Ley. *Viking, $4.95; 468 pp., illus.*

THE word "exotic" is a teaser, bringing to mind the serpents and dragons with which Mr. Ley's book abounds. Ley is more of an antiquarian than a scientist, although he offers facts as well as myths; he dredges in the muddy waters of lore with a will, while presenting modern findings at the same time. Moas, mammoths, animals vegetable, animals fancied, and even animals real—a potpourri of the amazing and the common. But it all makes for strangely unexciting reading—perhaps because of a wooden style, perhaps because the problems that

Thrill to the Miracle World of ANTS
Now Only
$2.98

This sturdy 6"x9" unbreakable clear plastic Ant Farm provides an education for the children—a nature study for all. You watch as ants create an empire . . . the feeder ants storing supplies . . . the nurse maids caring for the young . . . and they're easy to care for. Your Ant Farm comes to you complete with soil, sand, sandbar, plus a generous supply of live Harvester ants, and only $2.98 ppd. Giant 10"x15" Ant Farm for $6.95 ppd.

MODERN TOY CO. DEPT. 4T7
7039 Sunset Blvd., Hollywood 28, Calif.

THE STARS . . .
BROUGHT DOWN TO EARTH!

You'll enjoy the new astronomy magazine that everyone is talking about . . . THE MONTHLY EVENING SKY MAP.

★ Clear, intelligent articles for the nature lover, layman, and amateur astronomer.
★ Large and detailed maps of sky and planets for each month of the year.
★ Special features on telescopes, satellites, meteors, and planets.
★ Guide to users of small telescopes, showing objects of interest.

SAMPLE FREE ISSUED BIMONTHLY
$3.00 PER YEAR
THE MONTHLY EVENING SKY MAP

Sky Map Publications, Inc.
Box 213-N (Clayton Branch)
St. Louis 5, Missouri

SEA SHELLS

For Collectors. Thousands of species from over forty countries of the world. A grand hobby and educational too. Send your name today for FREE illustrated lists.

HERMAN W. HOLLINGSWORTH, Seffner, Fla.

PAT PENDING
10-DAY MONEY-BACK GUARANTEE 1 YR. WARRANTY

FOR PRO RESULTS
PROFESSIONAL FLUID PAN-HEAD
. . . used internationally by leading studios and professional movie photographers. Equivalent to high-priced models — ONLY $89.50, for a limited time! Free Descriptive Literature. SEND CHECK — MONEY ORDER.
FORBES-ROBINSON, INC. • Dept. HH-1, 4607 Alger St. Los Angeles 39, California

BIG, BEAUTIFUL FULL COLOR
TIDE POOL MARINE LIFE
Twelve 11" x 14" color study prints
sturdy Kromkote stock
Set of 12 — $8.95
FILMSCOPE INC.
BOX 397 — SIERRA MADRE, CALIF.

4 MAGNETS only $1.00 P.P.
Alnico #5
Unbelievably powerful permanent semi-bar magnets, size 1⅛" x 11/16" x ⅜" and weight of 1 oz. each. 1000 uses around the kitchen, home, shop, plant, laboratory. Also, a variety of amazingly astonishing gravity-defying tricks can be performed. Formerly sold for over four dollars, now—4 magnets including trick sheet. $1.00 p.p. Limited stock. Magnets going fast. Rush your order with remittance to:
HARRY ROSS Scientific & Lab. Apparatus 61-M Reade Street N.Y. 7, N.Y.

WHY DON'T YOU WRITE?
EARN EXTRA MONEY IN SPARE TIME writing short stories, articles on nature, business, homemaking, hobbies, travel, local, club and church activities. You learn by writing at home under the guidance of professional writer-editors through the fascinating N.I.A. Copy Desk Method.
FREE "Writing Aptitude Test" tells whether you have qualities to become a successful writer. Write for it NOW. No cost or obligation. 35th Yr. Licensed by N.Y. State.
NIA NEWSPAPER INSTITUTE OF AMERICA
Suite 5780-M, One Park Ave., N.Y. 16, N.Y.

LOOK
thru a roof prism
HENSOLDT WETZLAR
Made in West Germany
SEE the difference!

A view so clear, so brilliant! That's due to Hensoldt's roof-prism design and fine optical construction. Slender . . . Easy to hold . . . Compact . . . Rugged. Magnifications of 7x, 8x, 10x, 16x. At leading dealers.

Write for leaflet.
CARL ZEISS, INC., 485 Fifth Ave., New York 17

"THEY TOOK ME FOR A RUSSIAN!"
Says Linguaphone Student in Moscow

William Henry Garvin mastered Russian right at home

***QUICKLY SPEAK* Spanish, French, German . . . any of 34 World Languages by New RELAXED WAY at Home**

Think how useful and exciting it is to speak another language like a native. The new RELAXED scientific shortcut — Linguaphone — makes it easy! *Almost overnight* you can *start* speaking like a native in Spanish, French, Italian, Russian, etc. — Right AT HOME without any effort at all.

34 Languages by Linguaphone on FREE TRIAL. Write for details Send for FREE Book Today.

LINGUAPHONE INSTITUTE
Dept. R-63-080, Radio City, N. Y. 20
Please send me: ☐ FREE Book, "Your Passport to Languages."
☐ Details of FREE TRIAL—no obligation
Name________
Address________
City______ Zone___ State___

Please check your language interest:
☐ Spanish (American)
☐ Spanish (European)
☐ French
☐ German
☐ Modern Greek
☐ Italian
☐ Russian
☐ Japanese
Other______

56 Annual Cumulation
c-1961
H. W. Wilson Co.

ed by Dorothy P. Davison

LEWITON, MINA—*Continued*

she has, after all—made it simpler than it actually is. The readers of the Rachel books will find this rather younger in appeal.
+ — Kirkus 27:492 Jl 15 '59 100w

"Interesting plot, good character development, very real people, honest presentation of the good and the bad in such immigrant groups recommend this title to all libraries. Especially recommended for any library which deals with an interracial public." M. C. Skinner
+ Library J 84:2730 S 15 '59 60w

"Miss Lewiton expresses Candita's feelings so well and portrays the teeming life of the Riveras and their neighbors with such validity and respect that many a native child will better understand our 'little Puerto Ricos.'" Miriam James
+ N Y Times Bk R p40 O 4 '59 150w

Reviewed by Charlotte Jackson
San Francisco Chronicle p29 D 20 '59 60w

"An honest and interesting portrayal of a little Puerto Rican girl's gradual adjustment to life in chilly, crowded New York. There is no glossing-over of difficult conditions, children unsupervised after school, and other problems faced by new Puerto Rican arrivals. The pictures are skilfully and sympathetically drawn."
+ Sat R 42:58 N 7 '59 40w

LEY, WILLY. Exotic zoology; il. by Olga Ley. 468p $4.95 Viking

560 Fossils. Animals, Mythical 59-8356

An omnibus of scientific mysteries, the fact and folklore of fabulous flora and fauna, this is a selection, up-dating, and revision of the author's three earler volumes: The Lungfish, the Dodo, and the Unicorn; Dragons in Amber; and Salamanders and other Wonders (Book Review Digest 1948, 1951, and 1955). Index.

Booklist 56:122 O 15 '59

"An interesting and thoroughly researched treatment of marvels of natural history by one of the best known science writers in America. . . It presents the clearest account of the abominable snowman, shows how paleontologists work at recreating the original condition of their finds, tells of the machinations in the buying and selling of fossils, and gives a fascinating, reliable description of sea serpents, ending with Ley's opinion that there may yet be discovered a large unknown animal of the seas. . . Especially for the student with inclinations toward natural history."
+ Kirkus 27:427 Je 15 '59 240w

"Each chapter in itself is as fascinating as a detective story. . . The earlier books have not lost their usefulness, since this volume includes only about one half of 'Dragons in Amber,' two thirds of 'Salamanders and Other Wonders,' and three fourths of 'The Lungfish, the Dodo & the Unicorn.' The subject matter is so intriguing and the style so full of suspense that anyone who picks up one of these books will want to read all the others. Recommended for all general collections." E. M. Cole
+ Library J 84:2365 Ag '59 230w

"For much of what he treats, [Ley] has provided the best elementary exposition that is easily available. . . In assembling his large collection of curious lore, Willy Ley has certainly come up with some things that will be new to the professional zoologist. How the latter will long for references! . . . Please when we have a new edition of 'Exotic Zoology' may we have not only lots of references, but also somewhat more critical judgments." G. E. Hutchinson
+ — N Y Herald Tribune Bk R p9 N 1 '59 1150w

LEYS, COLIN TEMPLE. European politics in Southern Rhodesia. 323p maps $6.75 Oxford

968 Rhodesia, Southern—Politics and government 59-1520

"A discussion of the social and economic foundations of European immigration to Southern Rhodesia, the structure of the government, pressure groups and political parties and the general operation of the political system." (Foreign Affairs) Bibliography.

"The author has done a real service in showing the white oligarchic control of Southern Rhodesia and the Federation. . . Appendixes on Northern Rhodesia and Nyasaland make European minority dominance even more obvious. The writer happily makes few predictions and fewer recommendations. To this reviewer some of the latter appear contradictory." C. R. Lovell
+ — Am Hist R 65:166 O '59 350w

"Whatever happens in Rhodesia, Mr. Leys' book will remain essential reading. No one else has dealt so comprehensively with the Rhodesian scene, or exhibited so much insight into its basic characteristics. While the first part of the work sometimes appears overloaded with facts and statistics, often presented in the form of graphs, they underpin the absorbing sections on politics which follow. Though one may disagree with some of Mr. Leys' personal judgments on Rhodesian attitudes and future trends, his penetrating analysis of a highly complicated situation is significant not only for those interested in Africa but also for all students of the political process." G. M. Carter
+ Am Pol Sci R 54:265 Mr '60 380w
Foreign Affairs 37:700 Jl '59 30w

"It is an erudite study, partly historical and partly analytical, of a political evolution little understood here. . . The author leaves no doubt where his sympathies lie, and does not look very hopefully to the future. But even those who do not wholly share his outlook can learn much from his thoughtful and lucid study." P. J. Monkhouse
+ Manchester Guardian p6 Je 5 '59 200w

"Mr Colin Leys is a Fellow of Balliol who brings energy, penetration, honesty and wisdom to his subject. He performs the remarkable and useful feat of preserving a fair balance of judgment in writing of a country where legislation has carefully provided that a small minority shall always be the masters, and a large majority shall always be the servants. . . His book is full of useful information; but it is also full of wise judgments. . . Not having written a political book, he sensibly refrains from hammering too loudly on the nail that is sharpened by his keen use of fact." Basil Davidson
+ New Statesman 57:372 Mr 14 '59 650w

"This is an imposing book. It is written with dry incisiveness and is free of . . . jargon. Mr. Leys lets the facts speak for themselves and is not making a case or propagandising. . . Mr. Leys has the gift of deadly accuracy. . . There are very few slips. . . The tables and diagrams in this first-rate work are admirable.' T. R. M. Creighton
+ Spec p448 Mr 27 '59 600w

"This seems at first sight a very small subject to which to devote such an exhaustive study. . . Yet the study remains a fascinating one, with a neat unity of its own, and of obvious importance. For the question which underlies the whole of the book is the central question for Rhodesia. . . Can the European minority so modify their political structure that, unlike South Africa, they can accommodate the rising aspirations of Africans? Mr. Leys presents formidable and well-marshalled evidence to suggest that it cannot. . . The picture he paints, with striking detail and dispassion, is therefore a gloomy one. . . The book was completed in April, 1958. Since then, events have moved swiftly in a direction which seems largely to justify Mr. Leys's analysis."
+ Times [London] Lit Sup p449 Jl 31 '59 800w

LHOTE, HENRI. Search for the Tassili frescoes; the story of the prehistoric rock-paintings of the Sahara; tr. from the French by Alan Houghton Brodrick. 236p il col il maps $6.95 Dutton

571 Tassili-n-Ajjer—Antiquities. Art, Primitive 59-4743

"Among the most fascinating episodes of recent archaeology is the discovery of the rock engravings and paintings . . . of the Tassili Mountains in the central Sahara. The first paintings were found by Lieut. Brenans in 1933. He informed Mr. Lhote, and they started to explore the region before the war broke out in 1939. It was not until 1956 that Lhote was able to organize a major expedition to the area, where he was to spend sixteen months with a large staff of artists and technical experts. He describes the difficulties under which the expedition labored. . . The thirty or more art forms represented in the Tassili paintings are provisionally arranged by the author in twelve main classes." N Y Herald Tribune Bk R

"The story of M
camels, drawing bo
impossible grades,
through wind and
while the painti
resistible." Phoebe
+ Atlantic 2
+ Booklist 5

Reviewed by W.
+ Chicago S
380w

"Most of the tex
story of the party'
in an astonishingly
as such it is a
Plates, maps, and
voted to the actua
tions, though with
sion of their sign
the analysis to wh
plements found w
sumably been subj
a good adventure
of the frescoes th
tion has here beer
ning, and the wh
necessary muddle
Willett
— Guardian

"The most info
are the quite ex
land and the peop
ings . . . and ad
the back. The res
ganized and unsuc
purna and Etrusc
a fondness for co
is moreover habitu
lator . . . has done
sary information
notes."
Kirkus 27

"Though the pi
the text, perhaps
pedition and overl
has an embarrasse
to add to the illu
regarded as objec
be, since no skelet
authorship, date, a
tirely obscure.
archaeological find
search, this book
ogy collections." J.
Library J

"Clearly, what
the implications o
history of the Sa
But this is a po
alone make it extr
—and on this sub
tempt to say a gr
though always illu
chatty account of
expedition, the ha
the fantastic mou
Lhote's concern is
tics." Thomas Hod
+ New State

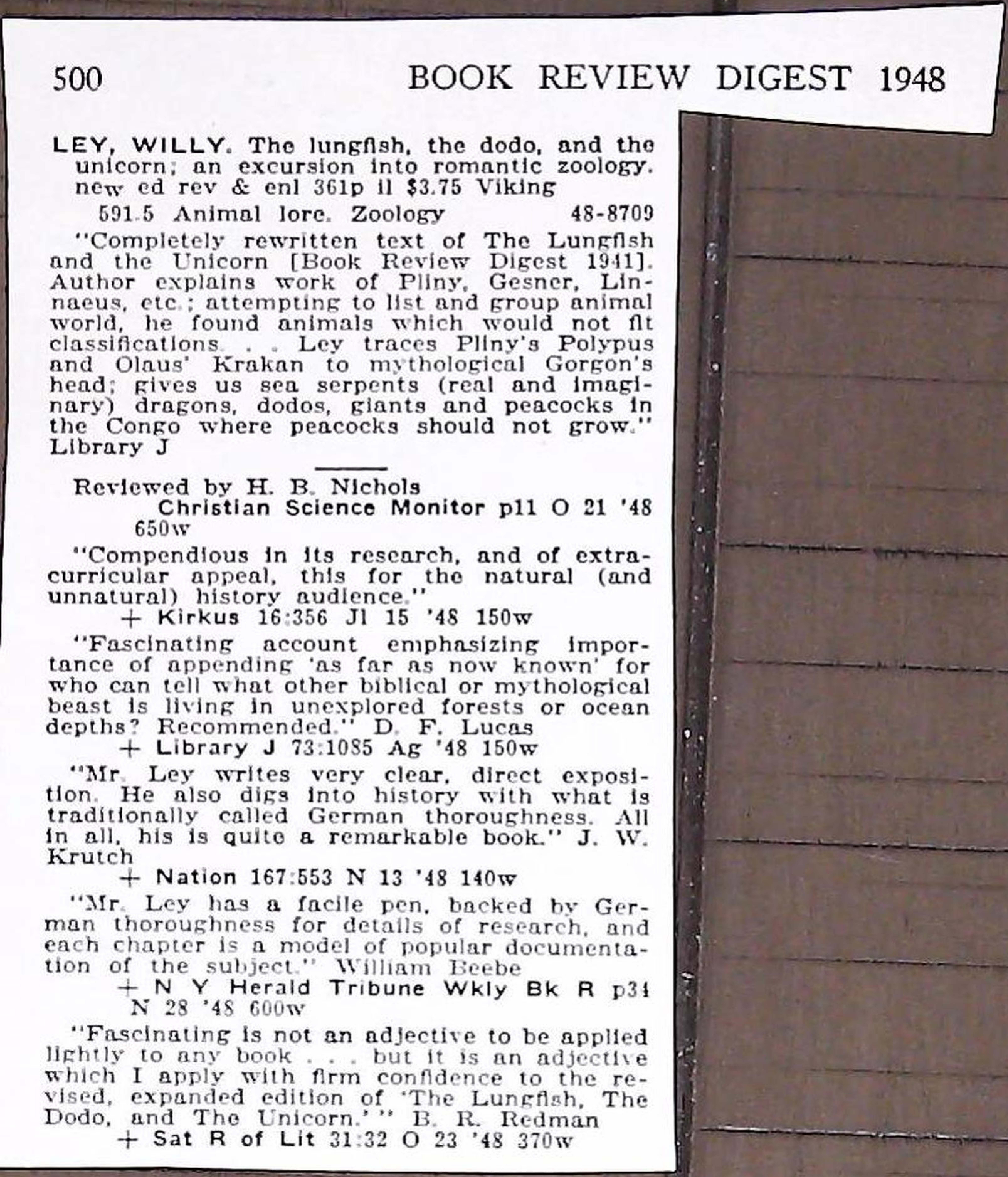
"Mr. Lhote's vo
the ignorant and
easily the most
ever made above g
entrancing as a
archaeological find
adventure." W. F.
+ N Y Hera
950w

"These pictures
is curious about
mankind in gener
is sometimes trivia
of author nor subj
magnificent." Basil
+ — N Y Time

"M. Lhote is a
speculations and c
fully interesting, b
the thing. They a
+ New York

"Told in a pop
deliberately under
the work and the
ment." Glyn Danie
Spec p777

"One of the m
the Sahara Desert
Lhote expedition,
dication of the Sa
another proof that



LEY, WILLY. The lungfish, the dodo, and the unicorn; an excursion into romantic zoology. new ed rev & enl 361p il $3.75 Viking

591.5 Animal lore. Zoology 48-8709

"Completely rewritten text of The Lungfish and the Unicorn [Book Review Digest 1941]. Author explains work of Pliny, Gesner, Linnaeus, etc.; attempting to list and group animal world, he found animals which would not fit classifications. . . Ley traces Pliny's Polypus and Olaus' Krakan to mythological Gorgon's head; gives us sea serpents (real and imaginary) dragons, dodos, giants and peacocks in the Congo where peacocks should not grow." Library J

Reviewed by H. B. Nichols
Christian Science Monitor p11 O 21 '48 650w

"Compendious in its research, and of extracurricular appeal, this for the natural (and unnatural) history audience."
+ **Kirkus** 16:356 Jl 15 '48 150w

"Fascinating account emphasizing importance of appending 'as far as now known' for who can tell what other biblical or mythological beast is living in unexplored forests or ocean depths? Recommended." D. F. Lucas
+ **Library J** 73:1085 Ag '48 150w

"Mr. Ley writes very clear, direct exposition. He also digs into history with what is traditionally called German thoroughness. All in all, his is quite a remarkable book." J. W. Krutch
+ **Nation** 167:553 N 13 '48 140w

"Mr. Ley has a facile pen, backed by German thoroughness for details of research, and each chapter is a model of popular documentation of the subject." William Beebe
+ **N Y Herald Tribune Wkly Bk R** p34 N 28 '48 600w

"Fascinating is not an adjective to be applied lightly to any book . . . but it is an adjective which I apply with firm confidence to the revised, expanded edition of 'The Lungfish, The Dodo, and The Unicorn.'" B. R. Redman
+ **Sat R of Lit** 31:32 O 23 '48 370w

Newsweek magazine

14 NOV 1955

page 119 - Ad by Ley

lls: A blend

around carnivals.
Vorld' pays off,"
week, "I'll begin

talk of annuities,
way from retire-
e World" is fin-
cash from this
life of Toscanini
r relaxation. I'm
ay that the mugs
hairs."
d of the maestro,
n set to work on
which he per-
cavalry forces of
e postponing this
ict that a super-
of Tolstoy's mas-
udrey Hepburn,
l Ferrer, finished
But for "War and
Todd promises,
new adjectives."

---

eenwich Village in
l about those two
io.
–The emotionally
a 10-year-old war
th his mother and

l Niven in an ab-
na.
mor, mystery, and
e Kelly cranes her
e Corniche.
e–Animals can still
Sweden's director-
Sucksdorff shows
ldlife study.

Fuels for the Stratosphere —And *Beyond!*

by WILLY LEY

Famous Rocket Expert

During my lecture tours, I visit a great many oil company laboratories. Each time I find oil scientists vitally interested in the fuels of tomorrow. In fact, our discussion automatically seems to turn to fuels for all kinds of rockets—for rocket-propelled aircraft—and finally—for space-going craft!

Rocket fuel research is highly complex—and very expensive. You see, there is no "best" fuel for rockets. Each rocket has special needs. For example, if your rocket is a military missile, it may have to stand ready, fully fueled, for quite some time. That calls for a fuel which can "stand and wait."

But if you have a towering research rocket which carries instruments beyond the stratosphere and pokes its nose into empty space to see how empty it actually is, you need a special fuel combination which can be put into the tanks just before firing.

Furthermore, we want rocket fuels to contain more than just a lot of energy. Like the motorist who wants a fuel without knock – the rocket engineer has lots of special wishes: his fuel must not freeze on cold days in the Arctic—nor can it develop high vapor pressure on a hot day in the tropics.

It must not be too light because lots of fuel weight in the tank is essential. It must be in plentiful supply because a large rocket burns about 300 pounds per second. For the same reason it must not cost too much. And it must be a good heat conductor because fuel is used to cool the rocket motor from outside before it is injected to burn inside. And to make the rocket engineer really happy, the fuel should not need any ignition but burst into flame spontaneously when meeting the liquid supplying the vital oxygen.

You can see that developing "perfect" rocket fuels is a tough assignment. But from what I've seen of oil scientists, they're sure to meet this challenge.

Willy Ley is one of the first pioneers in rocket research. As early as 1927 he became one of the founders of the German Rocket Society. Now a popular author and lecturer on "rocketry," Willy Ley is also a consultant to the Office of Technical Services of the Department of Commerce and a member of rocket societies all over the world.

Top automotive engineers will tell you that the moment they come up with an advanced engine design, oilmen always are ready with the proper fuel to power this engine efficiently and economically. And in rocket research, oil scientists have already contributed various jet fuels, ethyl alcohol for research rockets and the hydrazine needed for "ignitionless" rockets.

There is a good reason why American oilmen are always ready for tomorrow. It is the intensely competitive nature of the oil industry. No company can stand still even for a second. Each company exerts every effort to stay ahead of rivals by developing new and improved products at *the lowest possible price*. The result is progress – lots of it.

To me this is a perfect example of the way all of us —whether we are rocket engineers or just car owners – benefit from the American competitive business system.

This is one of a series of reports by outstanding Americans who were invited to examine the job being done by the U. S. oil industry.
This page is presented for your information by The American Petroleum Institute, 50 West 50th Street, New York 20, N. Y.